TM 11-5820-536-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ORGANIZATIONAL, DS, GS,
AND DEPOT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOL LISTS

REPEATER SET, RADIO AN/TRC-109(V)

HEADQUARTERS, DEPARTMENT OF THE ARMY

MARCH 1967

WARNING

HIGH VOLTAGE

is used in this equipment

DEATH ON CONTACT
MAY RESULT IF SAFETY PRECAUTIONS
ARE NOT OBSERVED

Maintenance adjustments of this equipment are made with power applied. Be careful when working near the interior of the equipment or near the ac power distribution.

WARNING

VENTILATION IS ESSENTIAL

To prevent asphyxiation, ventilate the
AN/TRC–109(V) at all times when occupied.

DON'T TAKE CHANCES!

Operator and maintenance personnel should be familiar with the requirements of TB SIG 291 before attempting installation or operation of the equipment covered in this manual. Failure to follow requirements of TB SIG 291 could result in injury or DEATH.

TECHNICAL MANUAL
No. 11–5820–536–15

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *17 March 1967*

Organizatinal, DS, GS, and Depot Maintenance manual Including Repair Parts and Special Tool Lists

REPEATER SET, RADIO AN/TRC–109(V)

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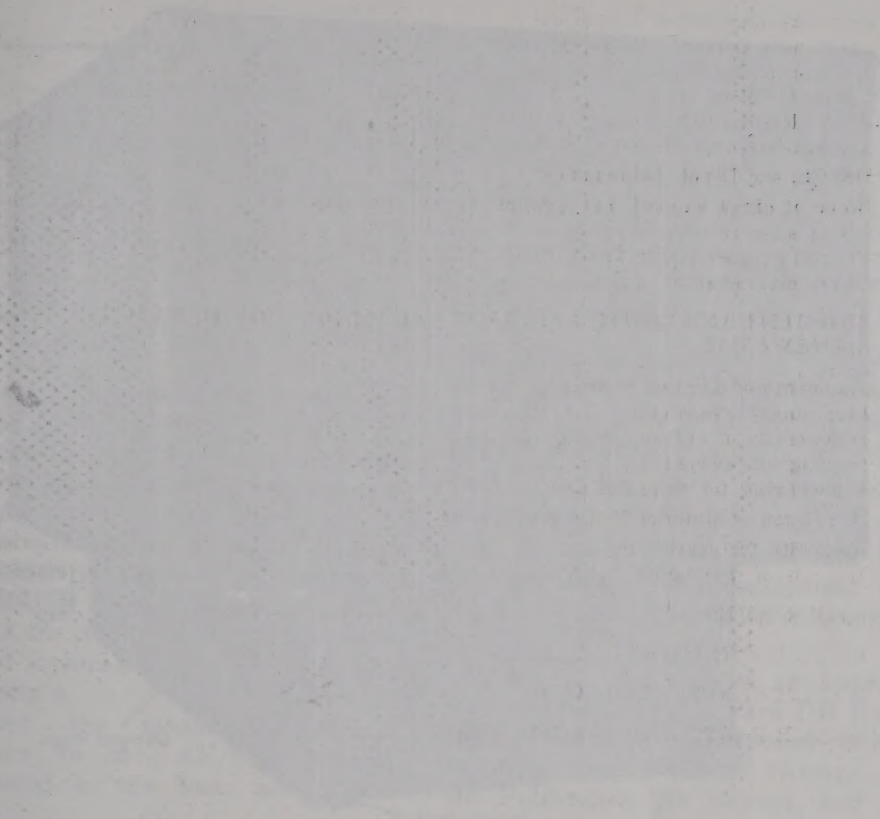


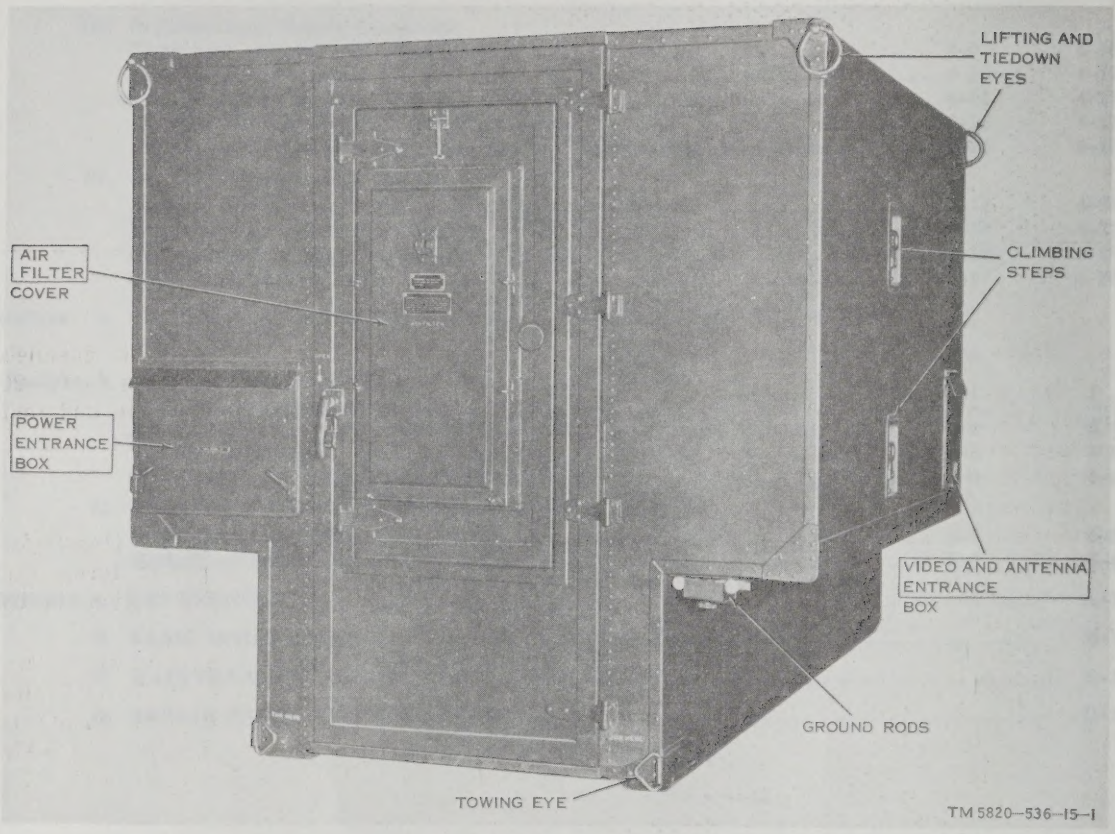


Figure 1–1. Repeater Set, Radio AN/TRC–109(V), rear curbside view.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Repeater Set, Radio AN/TRC-109 (V) (fig. 1-1). It includes instructions for installing, operating, and maintaining the AN/TRC-109 (V).

b. Throughout the manual, where appropriate, references are made to other publications which cover the installation, operation, and maintenance of those equipments which are installed in the AN/TRC-109 (V). A complete listing of applicable publications is provided in appendix A.

c. Throughout the manual, AN/GRC-50A (V) refers to the AN/GRC-50A(V) components listed in the basic issue items (appx B)

1-2. Index of Publications

Refer to the latest issue of DA Pam 310-4 to determine whether there are any new editions, changes, or additional publications pertaining to the AN/TRC-109 (V). DA Pamp 310-4 is a current index of technical manuals, technical bulletins, supply manuals (types 7, 8, and 9), supply bulletins, lubrication orders, and modification work orders which are available through publications supply channels. The index lists the individual parts (-10, -20, -35, etc.) and the latest changes to and revisions of each publication.

1-3. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38-750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damage or Improper Shipment) as prescribed in AR 700-58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71-4 (Air Force).

c. Reporting Equipment Manual Improvements. Report of errors, omissions, and recommendations for improving this manual by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-MR-NMP-AD, Fort Monmouth, N.J. 07703.

Section II. DESCRIPTION AND DATA

1-4. Purpose and Use

a. Repeater Set, Radio AN/TRC-109 (V) (figs. 1-1 and 1-2) is an air- or vehicular-transportable assemblage used to provide multichannel radio and cable telephone communications for use by Airborne Corps communications systems.

b. The AN/TRC-109(V) contains two complete equipment systems. The systems may be connected as a 12/24/48 channel pulse-code-modulation (pcm) cable repeater, a 12- or 24-channel cable-radio conversion, or a 12- or 24-channel radio repeater. The AN/TRC-109(V) may also be used as a radio repeater in a frequency division multiplex (fdm)

system. Typical applications of the AN/TRC–109(V) in a pcm communication system are shown in figure 1–3. The equipment components used in each configuration are shown in the block diagram in figure 1–4. Antenna components for the AN/TRC–109(V) are transported in Generator Set, Gasoline Engine, Trailer Mounted PU–626/G, shown in figures 1–5 and 1–6.

c. In the AN/TRC–109(V) type designation, the letter (V) indicates that variations in the radio equipment components are available to the user. Either of two frequency bands (determined by the specific radio equipment components used) in the ultrahigh-frequency (uhf) range may be used to satisfy operatin frequency requirements.

1–5. Components

The basic issue items (appx B) lists the components that comprise an operable AN/TRC–109(V). The major operating components consist of two Transmitters, Radio T–893(P)/GRC, two Receivers, Radio R–1131(P)/GRC, two Power Supplies PP–2054/GRC, one Regulator, Voltage CN–514/GRC, two Multiplexers TD–204/U, two Multiplexers TD–202/U, one overvoltage protective device, and one telephone Set TA–312/PT. All the

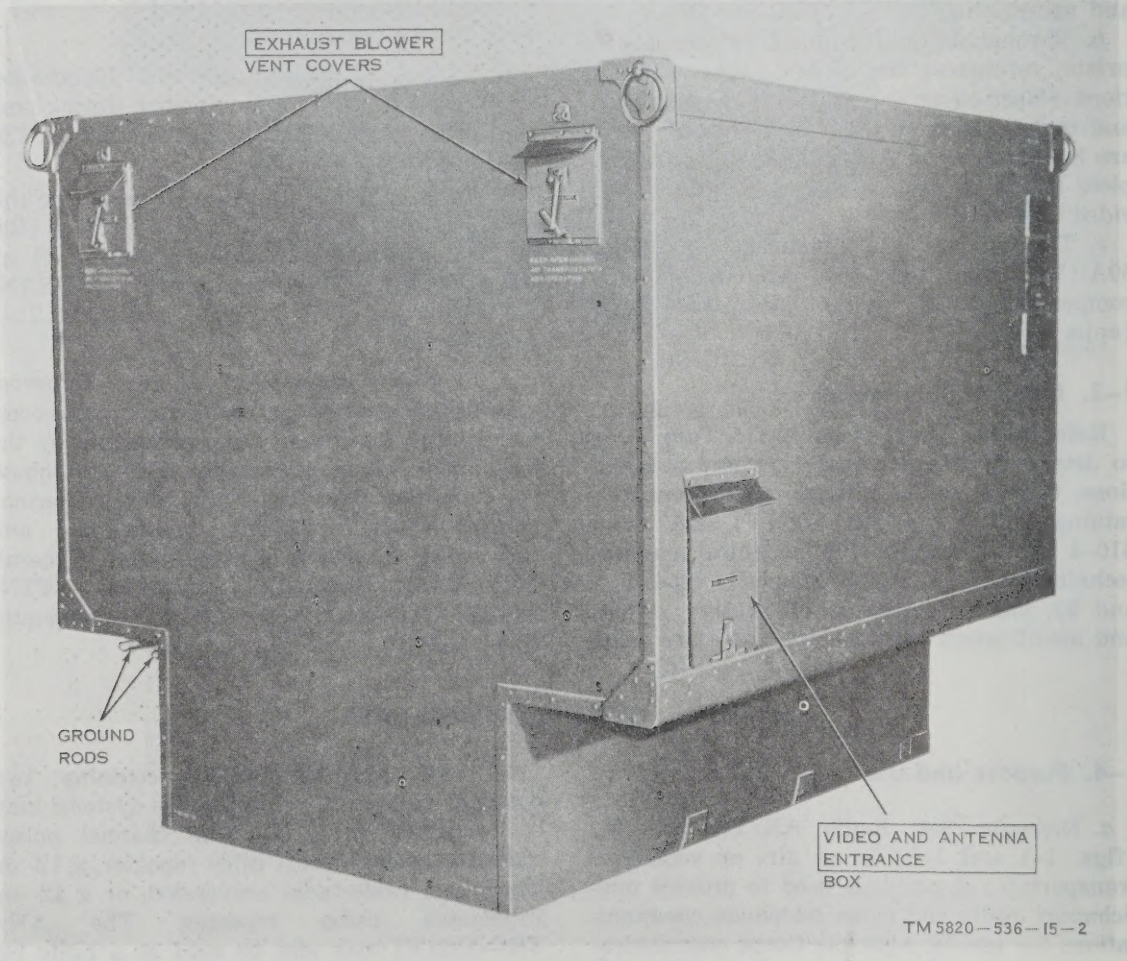


Figure 1–2. Repeater Set, Radio AN/TRC–109(V), front roadside view.

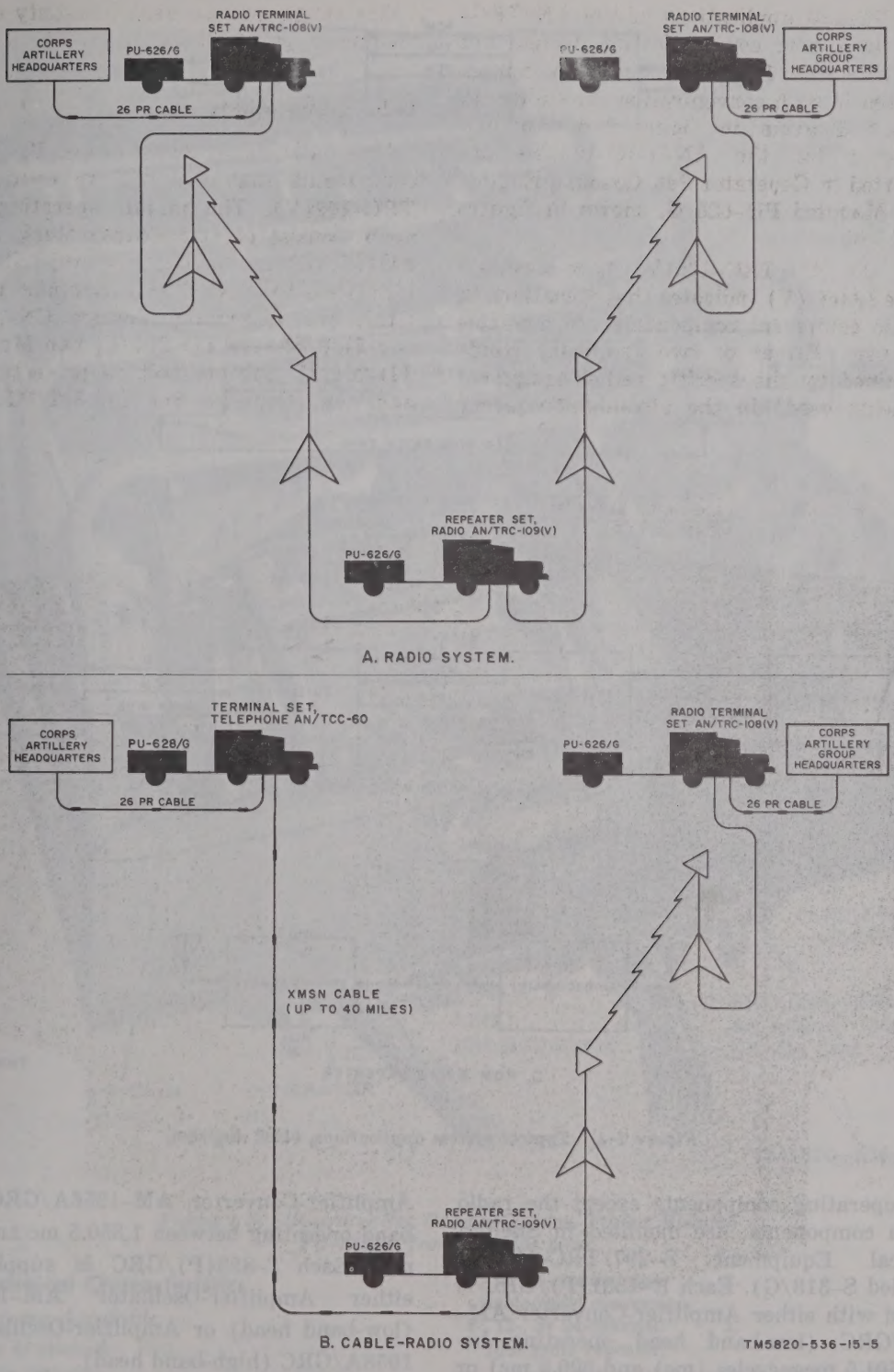
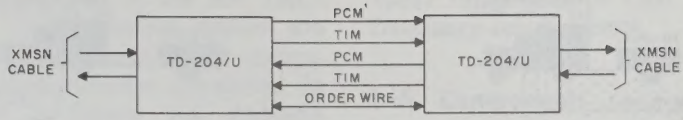
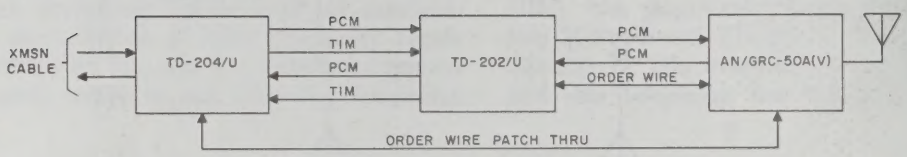


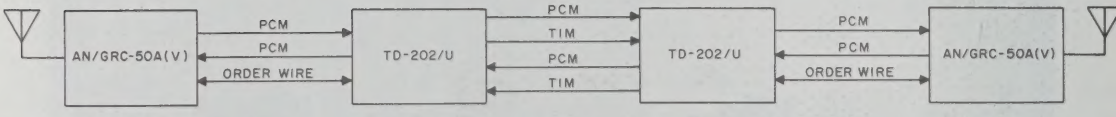
Figure 1–3. Typical applications of AN/TRC–109(V).



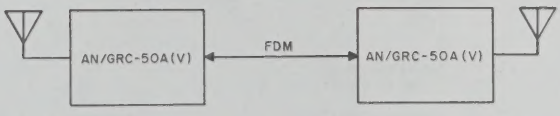
A. PCM CABLE REPEATER.



B. PCM CABLE-RADIO CONVERSION.



C. PCM RADIO REPEATER.



D. FDM RADIO REPEATER

TM5820-536-15-6

Figure 1-4. Typical system applications, block diagram.

major operating components except the radio antenna components, are mounted in Shelter, Electrical Equipment S-297/TRC-109(V) (modified S-318/G). Each R-1331(P)/GRC is supplied with either Amplifier-Converter AM-1955A/GRC (low-band head operating between 601.5 megacycles (mc) and 999.5 mc) or Amplifier-Converter AM-1956A/GRC (high band operating between 1,350.5 mc and 1,849.5 mc). Each T-893(P)/GRC is supplied with either Amplifier-Oscillator AM-1957/GRC (low-band head) or Amplifier-Oscillator AM-1958A/GRC (high-band head).

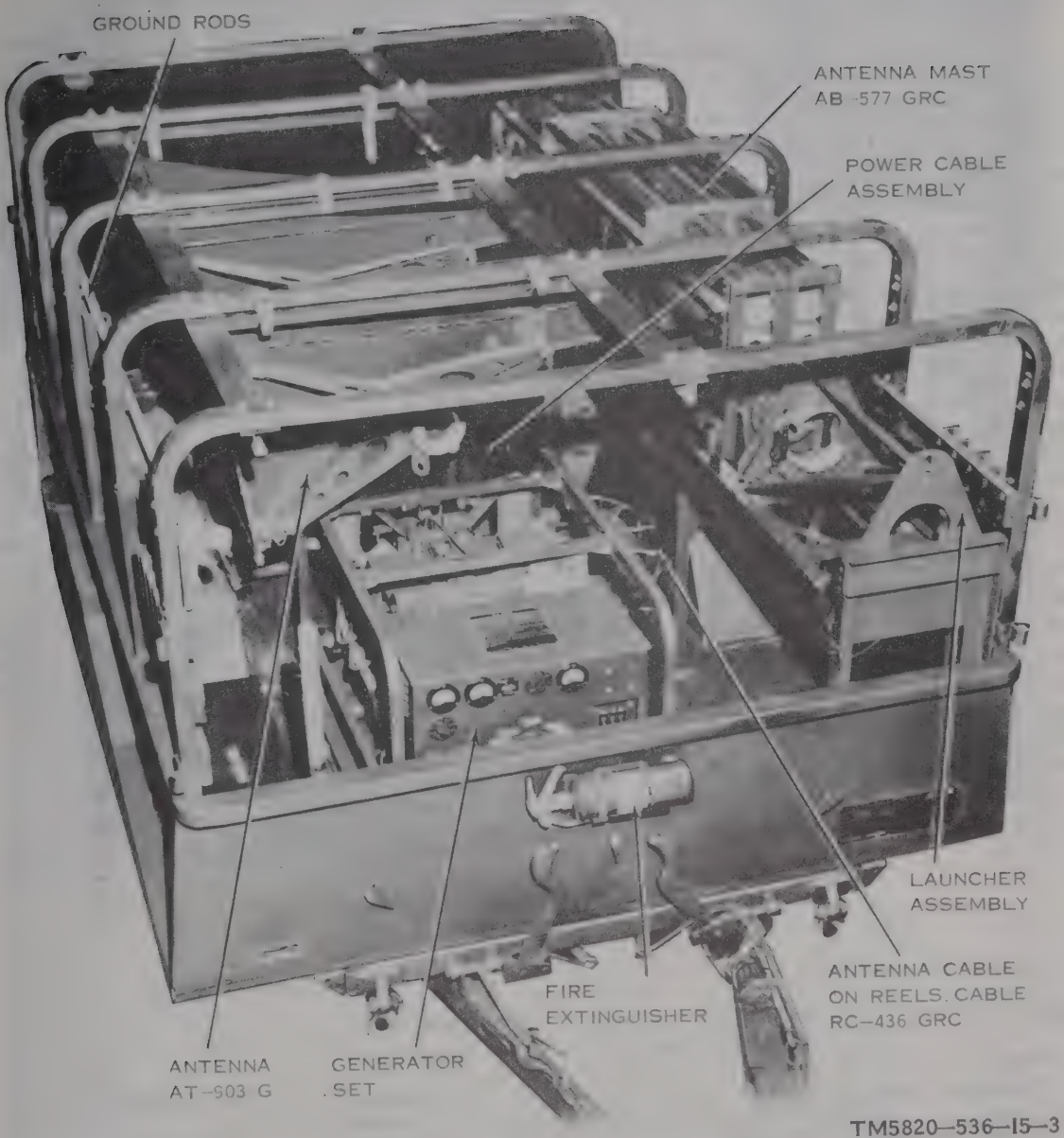


Figure 1–5. Generator Set, Gasoline Engine, Trailer Mounted PU–626/G, front curbside view.

1–6. Technical Characteristics

a. Systems Available.

12-, 24-, or 48-channel pcm cable repeater.	1.
12- or 24-channel pcm radio repeater.	1.
12- or 24-channel pcm cable-radio conversion.	2.
4-, 12-, or 24-channel fdm radio repeater.	1.

Note. Both a cable repeater and a radio repeater may be connected in the AN/TRC–109(V) if required.

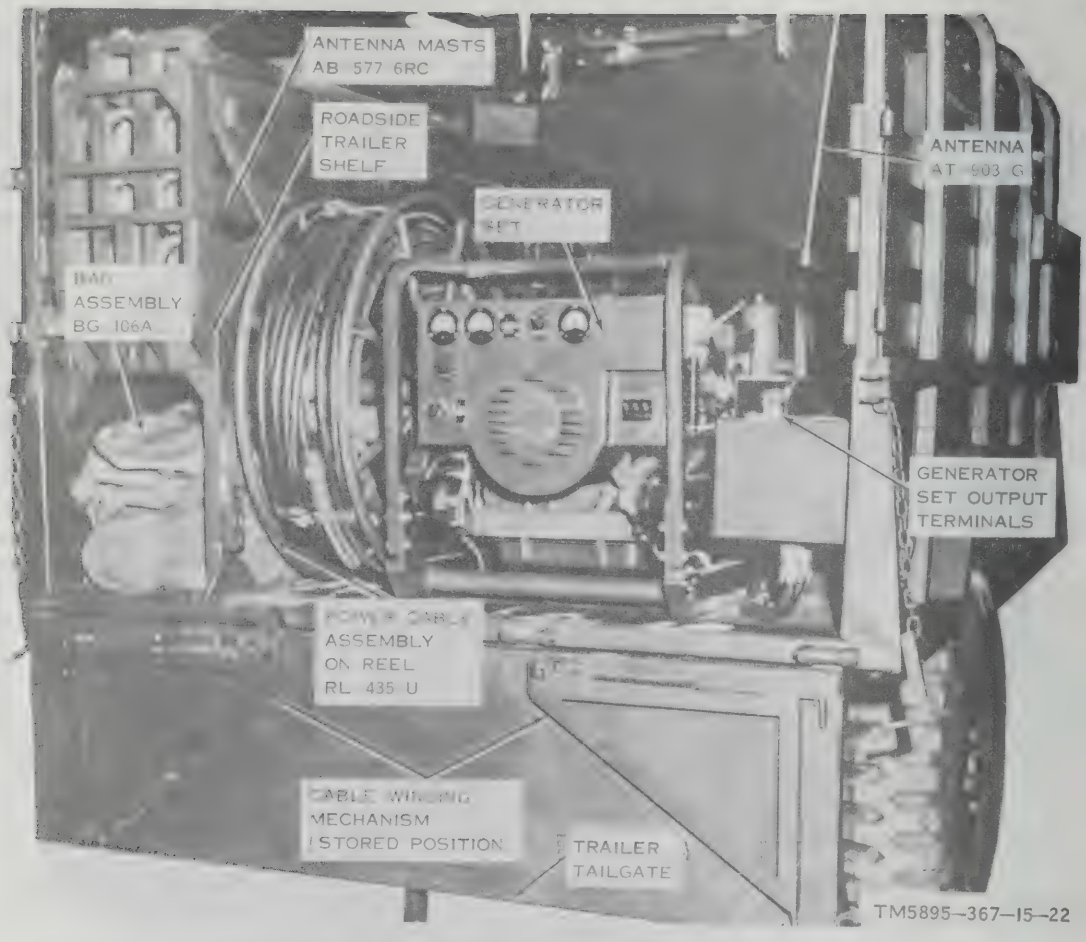


Figure 1–6. Generator Set, Gasoline Engine, Trailer Mounted PU–626/G, rear curbside view.

b. Power Requirements.

Type ..... 115 volts ±11.5, 50 to 60 cps, single phase.

Consumption:

Fluorescent lights (2).	40 watts.
Incandescent lights (2).	50 watts.
POWER DISTRIBUTION PANEL.	4 watts.
Exhaust blowers (2)	440 watts.
Heater	1,500 watts.
PP–2054/GRC (2)	1,550 watts.
R–1331(P)/GRC (2)	630 watts.
CN–514/GRC	40 watts.
TD–202/U (2)	80 watts.
TD–204/U (2)	124 watts.

c. Radio Signal Characteristics.

Operating bands:

Low-band:

Frequency range.	601.5 to 999.5 mc.
Channels	1 through 399.
Channel separation.	1 mc.

High-band:

Frequency range.	1,350.5 to 1,849.5 mc.
Channels	400 through 899.
Channel separation.	1 mc.

Transmitter power:
- Low-band—15 to 30 watts.
- High-band—8 to 20 watts.

No. of voice channels (each system)—12 or 24 plus order wire.

d. Pcm Cable Characteristics

Pulse type—Binary dipulse.

Pulse amplitude:
- To cable—2 volts peak.
- From cable—30 mv pp nominal.

Cable type—CX–4245/G or equivalent.

Input and output impedance—62 ohms.

Pulse rate and interval:
- 12-channel—576 kc, 1,736 nsec.
- 24-channel—1,152 kc, 868 nsec.

e. Local Communications Facilities.

Telephone—TA–312/PT.

f. Mechanical Characteristics.

Dimensions:
- Length—79 inches.
- Width—73 1/2 inches.
- Height—68 inches.

Weight—1,050 pounds.

Volume—215 cu ft.

Center of Gravity
- Sides—34.5 inches from skid base and 42 inches from entrance wall.
- Front and rear—34.5 inches from skid base and 36 inches from roadside wall.

1–7. Description

(figs. 1–1, 1–2, 1–7 through 1–11, and 5–1)

The major components of the AN/TRC–109(V) are mounted in shelter, Electrical Equipment S–297/TRC–109(V) and in Generator Set, Gasoline Engine, Trailer Mounted PU–626/G. The major radio and pcm components are mounted in the equipment racks in the front of the assemblage. The equipment racks are fastened to the walls, floor, and ceiling of the shelter. The CN–514/GRC and spare parts kits are mounted on the roadside of the assemblage. Assemblage lighting is provided by fluorescent light fixtures on the ceiling and by a pair of incandescent lights used in cold conditions when the fluorescent lights will not start. The assemblage is fully insulated and weatherproofed and is provided with heating facilities. Vents are also provided for connection of an external air conditioner. The antennas, mast, cables, and power cables are mounted in the PU–626/G trailer. Component locations, accessory mountings and control locations are shown in figures 1–7 through 1–11 and in figure 5–1. Power connections to the assemblage are made through the POWER ENTRANCE BOX (fig. 1–12), and video cable and antenna connections are made through the VIDEO & ANTENNA ENTRANCE box (fig. 1–13).

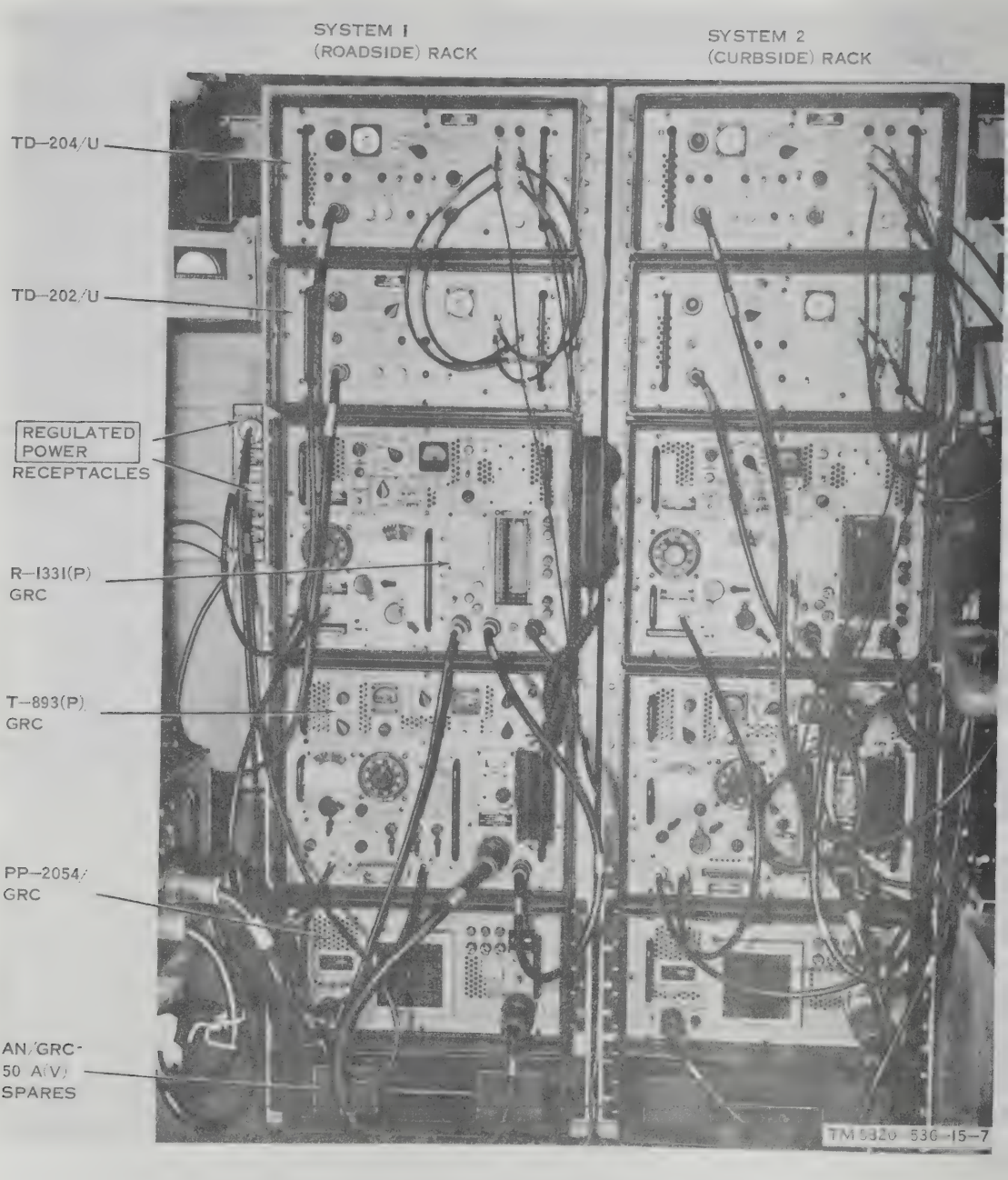


Figure 1-7. AN/TRC-109(V), interior front view.

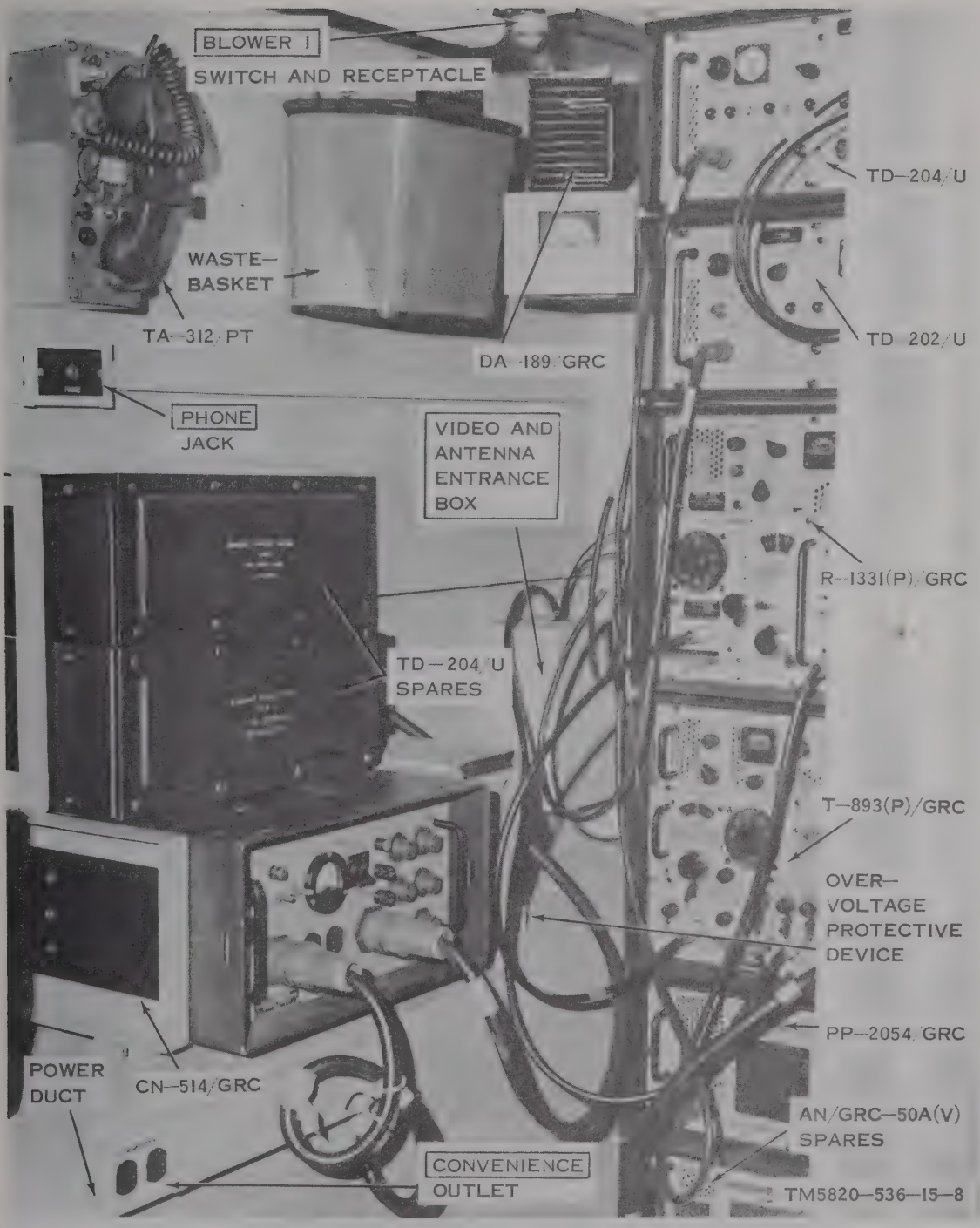


Figure 1–8. AN/TRC–109(V), interior front roadside view.

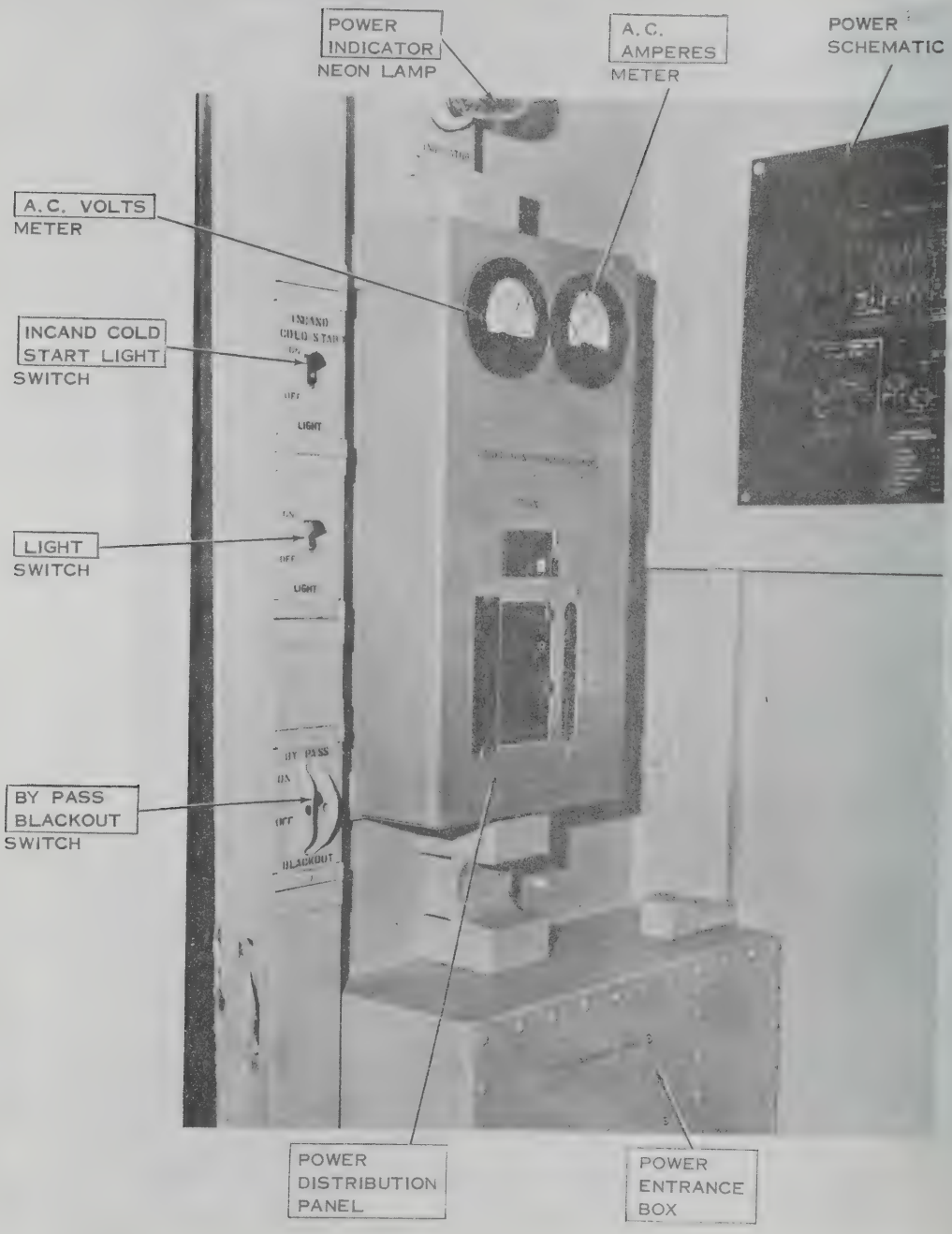


Figure 1-9. AN/TRC-109(V), interior rear roadside view.

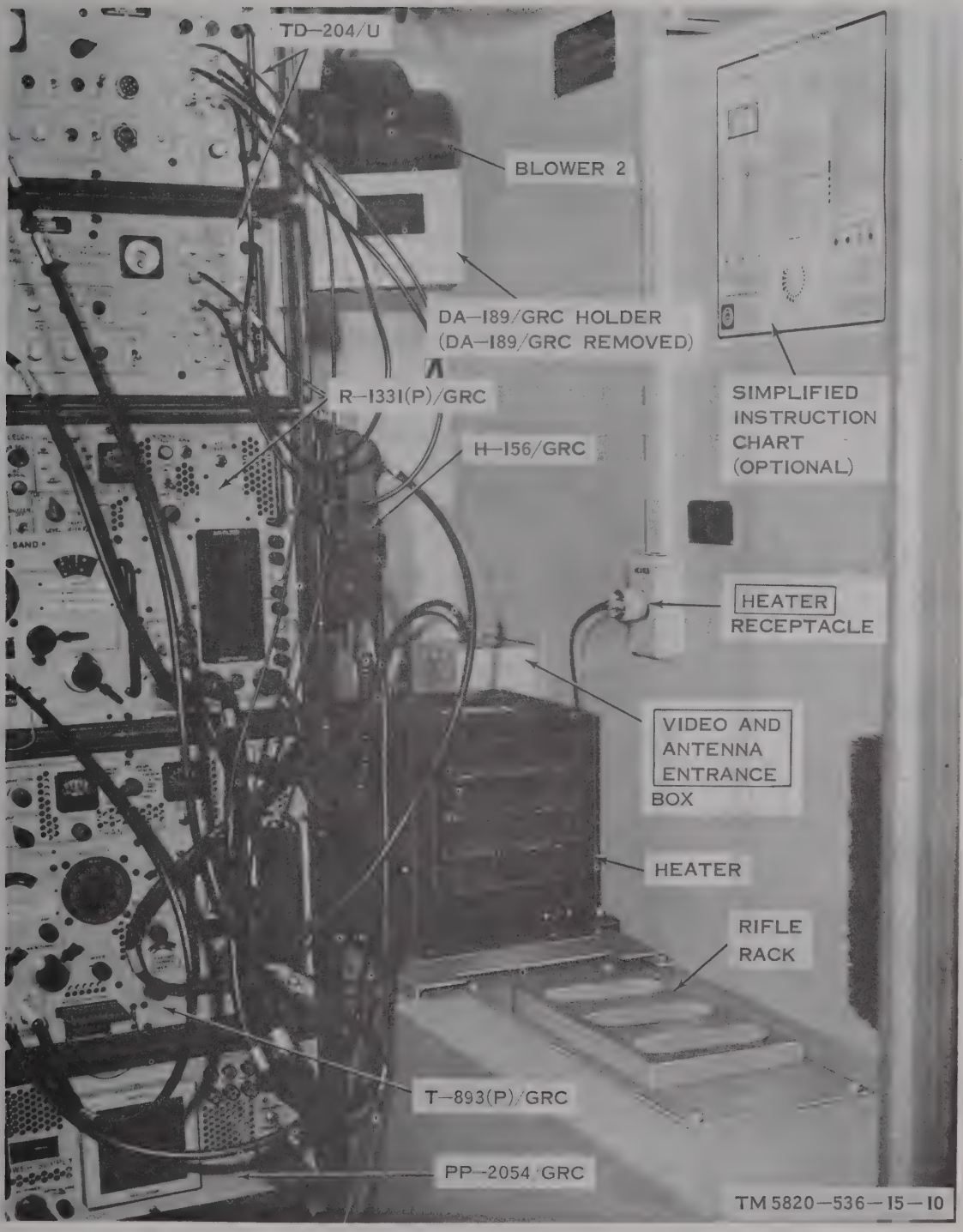


Figure 1-10. AN/TRC-109(V), interior front curbside view.

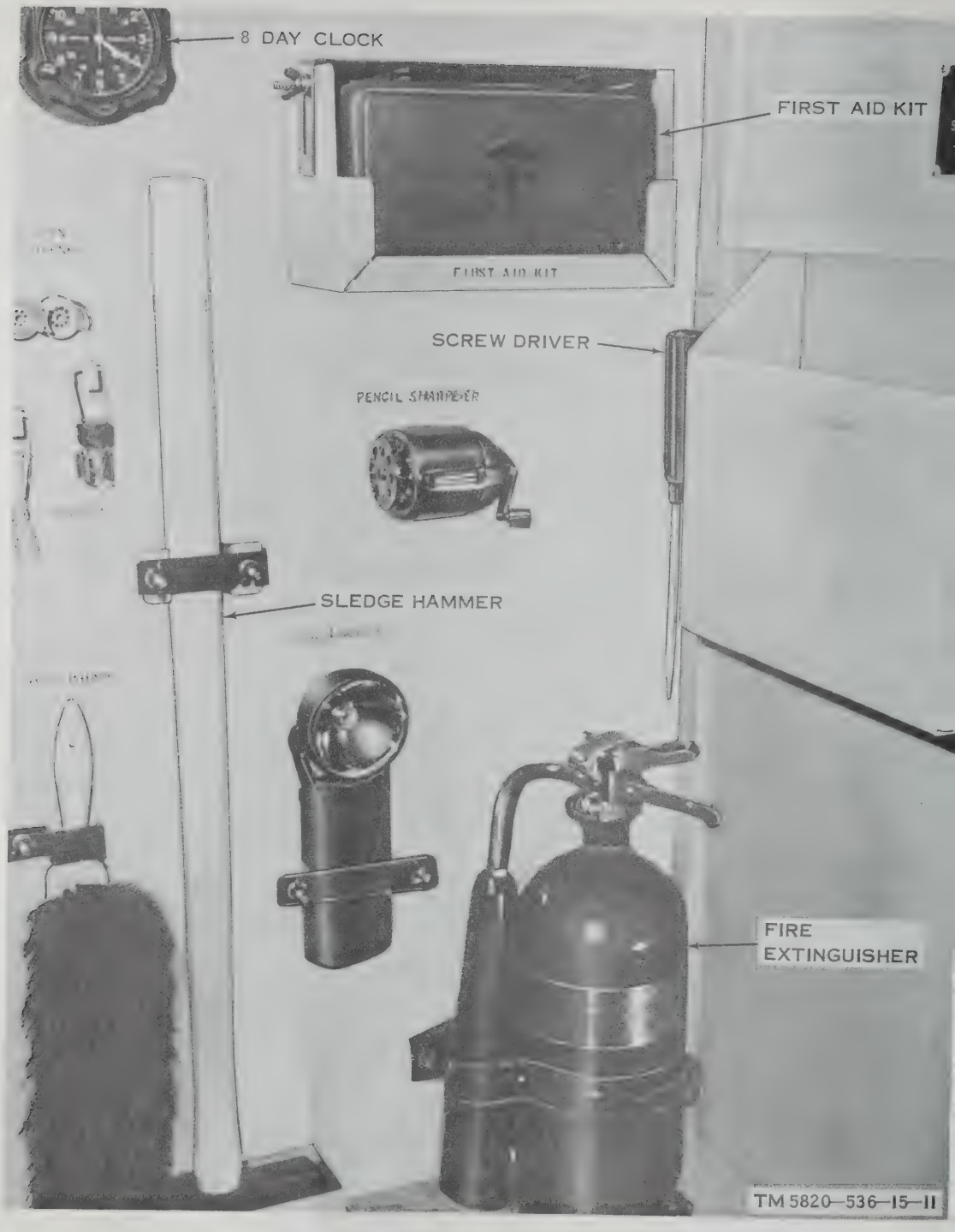


Figure 1-11. AN/TRC-109(V), interior rear curbside view.

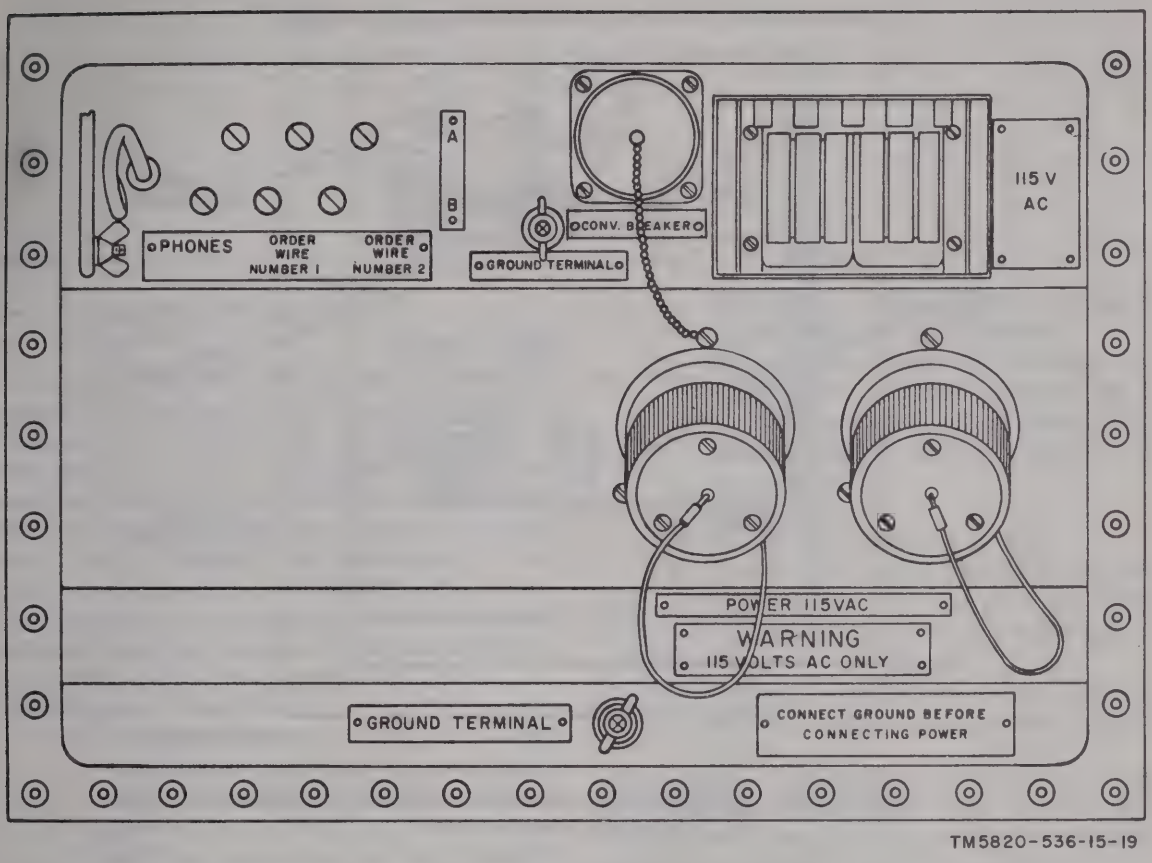


Figure 1–12. AN/TRC–109(V), POWER ENTRANCE BOX, exterior view, less cover.

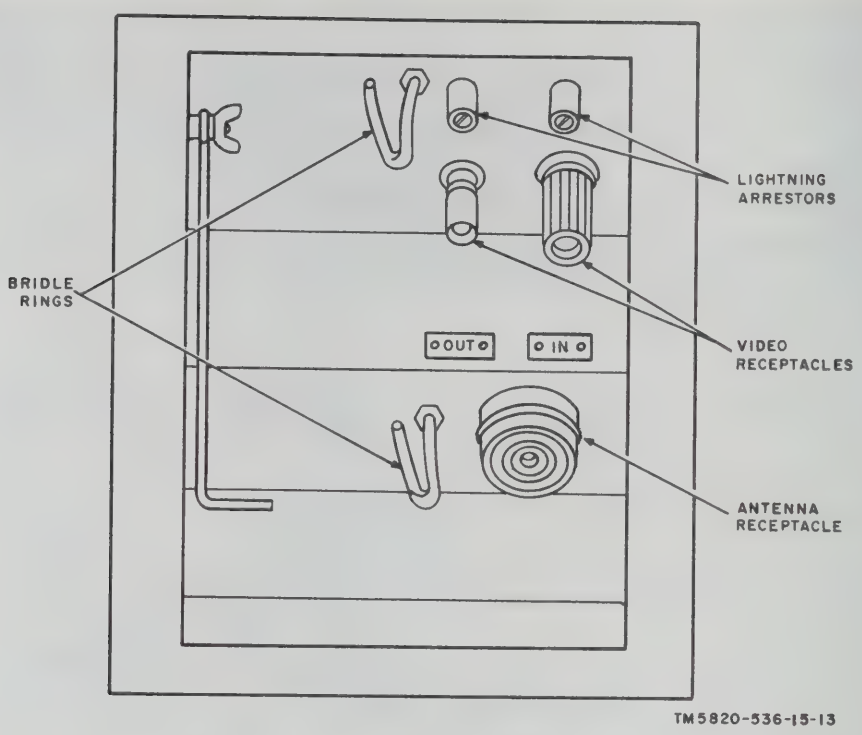


Figure 1–13. AN/TRC–109(V), VIDEO & ANTENNA ENTRANCE box, exterior view, less cover.

CHAPTER 2

INSTALLATION

2-1. Unpacking and Checking (fig. 2-1)

a. Packaging Data. The AN/TRC-109(V) is packed in a reusable wooden crate. The S-297/TRC-109(V), which houses the equipment, is anchored to eyebolts in the skid base of the crate and is blocked at the sides and ends with lumber. The skid base has entries for handling with a forklift. The dimensions of the crate are approximately 100 by 80 by 74 inches. The volume is approximately 340 cubic feet, and the weight of the crated AN/TRC-109(V) is approximately 1,300 pounds.

b. Removal From Crate.

(1) Unfasten the lag screws with wrenches and remove the top, end, and side panels from the crate base.

(2) Loosen the turnbuckles and detach the sling assemblies from the eyebolts in the crate base.

(3) Remove the wood blocking from the ends and sides of the AN/TRC-109(V).

Caution: Be careful when handling tools, because the aluminum skin of the S-297/TRC-109(V) can be easily damaged.

(4) Remove the S-297/TRC-109(V) from the crate base. Use overhead lifting equipment whenever possible. If overhead lifting quipment is not available, remove the headers from the crate base, and drag the S-297/TRC-109(V) from the crate base by the towing eyes. A forklift may be used to lift the S-297/TRC-109(V) from either end of the crate base. If a forklift is used, be extremely careful, because the skin of the S-297/TRC-109(V) may be easily damaged by the prongs of the forklift.

(5) Forward the crate (reassembled, or with the sections tied together) to a local storage area, if practicable. The crate may be reused for shipment of similar items.

c. Removing Contents.

(1) Unlock and open the door.

(2) Unscrew the cable reel holders that secure the cable reels to the floor and place them in their mountings.

(3) Remove the cable reels.

(4) Remove the ladder and place it on the ground or against the tailgate of the truck.

d. Checking Assemblage Contents. Check the contents of the assemblage against the packing list. If the packing list is not available, use the basic issue items list (appx B).

2-2. Siting

The best operating site for the AN/TRC-109(V) is determined by the tactical situation, and other local conditions.

Note. To install the AN/TRC-109(V) on the ground, or on a truck, four men and a device capable of lifting 1,050 pounds are required.

a. Ground Installation. When installed on the ground, the AN/TRC-109(V) should be placed on a firm, dry surface with good drainage; the site should be prepared and leveled. The assemblage should be placed on concrete blocks or wooden beams, if possible, and positioned to facilitate connections of power and signal cables. If a generator set is used to provide power, it should be located approximately 75 feet away from the assemblage to minimize fire hazard and generator noise interference.

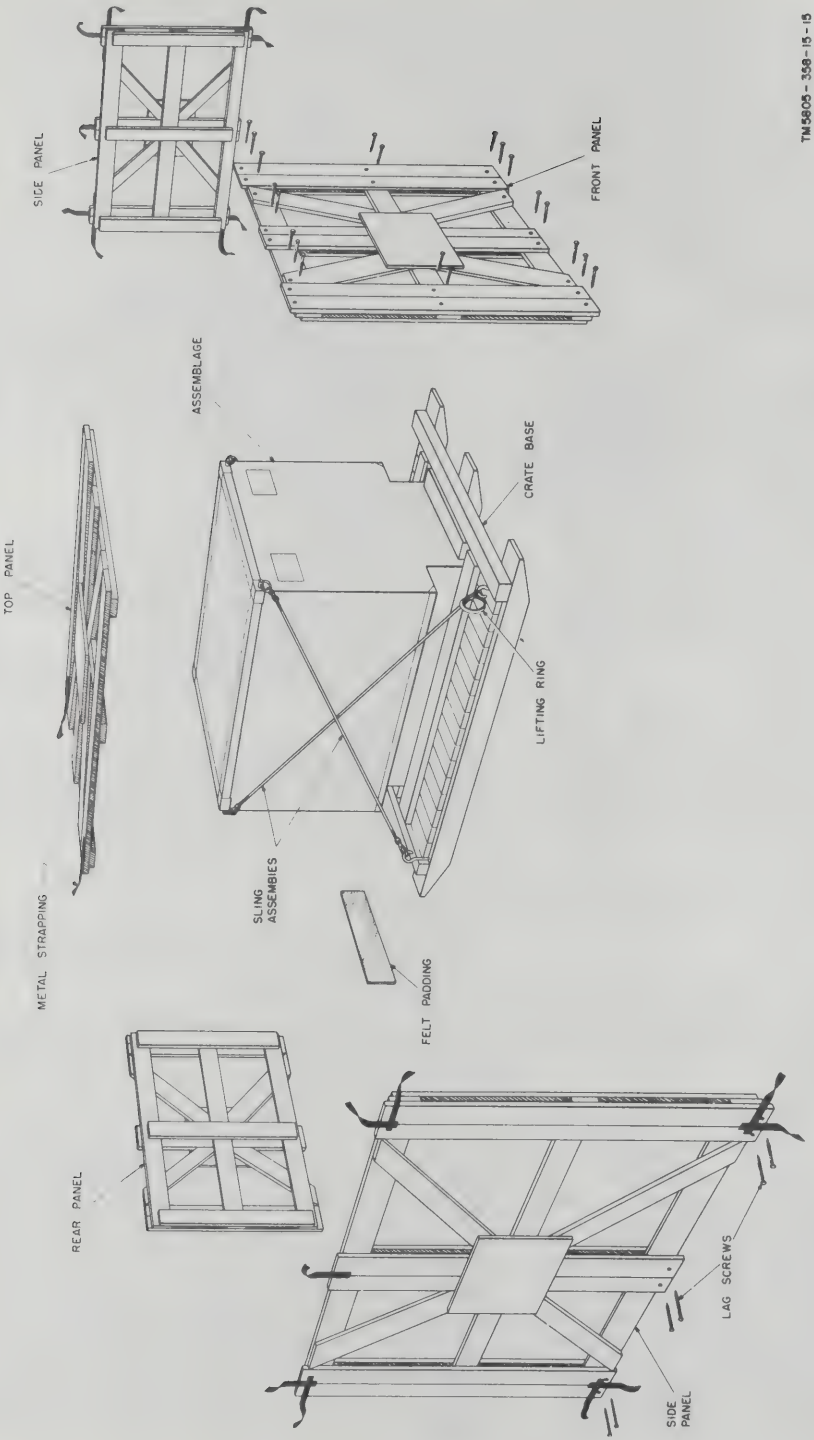


Figure 2–1. Typical packaging diagram.

b. Truck Installation.

(1) Use the sling hooks (nearest turnbuckle) to connect the sling assemblies to the lifting and tiedown eyes of the assemblage (fig. 2–2). Connect the sling hooks, at the opposite ends of the cables, to the lifting ring, and place the lifting ring over the lifting hook of the lifting device.

Warning: **To avoid injury to personnel, or damage to equipment, only personnel engaged in the actual loading operation should be permitted near the truck, lifting device, and assemblage. To eliminate confusion, all instructions must come from the loading crew supervisor.**

(2) Tie a 1/2-inch rope (at least 15 feet long) at each rear towing eye.

(3) Lower the tailgate of the truck; make sure that all tools and equipment have been removed from the body of the truck. Slowly lift the assemblage high enough to clear the body of the truck.

Note. The entrance door of the assemblage must be at the rear of the truck, and the front end of the assemblage must be flush against the front of the truck body.

(4) Position a man at the free end of each of the 1/2-inch ropes to guide the assemblage. Back the truck slowly into position under assemblage and slowly lower the assemblage into the truck.

Warning: **All personnel must remain clear of the truck while the assemblage is being lowered onto the truck.**

(5) Remove the lifting ring from the lifting hook and disassemble the lifting ring and the sling hooks. Remove the sling hooks from the lifting and tiedown eyes and the 1/2-inch ropes from the rear towing eyes. Raise and secure the truck tailgate.

(6) Use two sling assemblies at each side of the assembly to secure the assemblage to the truck as shown in figure 2–3.

(7) Tighten all turnbuckles evenly by hand, and then turn each turnbuckle an additional one-half turn with a bar or rod inserted into the slot of the turnbuckle.

Caution: **Do not overtighten turnbuckles. Overtightening turnbuckles will damage the assemblage.**

(8) After the truck is driven to the operating site, lower the tailgate to the horizontal position; then remove the ladder from the assemblage and secure it to the left side of the tailgate.

c. Unloading Assemblage. To unload the assemblage from the truck, reverse the procedures given in *b* above.

2–3. Grounding

The AN/TRC–109(V) must be properly grounded *before* input power is connected. Select a grounding site (within 6 feet of the POWER ENTRANCE BOX) that is low and damp, and that will not interfere with the entrance door, field wires, and power or signal cables.

a. Loosen and lift the cover of the POWER ENTRANCE BOX (fig. 1–1).

b. Use the cover support to secure the cover in the open position.

c. Remove a ground rod and the sledge hammer from their mountings (fig. 5–1).

d. Remove any dirt or grease from the ground rod.

e. Scoop out a small hole, about 6 inches deep, at the selected grounding site.

f. Drive the ground rod into the hole until the top of the ground rod is approximately 3 inches above the *bottom* of the hole.

g. Remove a 10-foot ground stap from the storage drawer in the assemblage.

h. Connect one end of the ground stap to the ground rod and the other end to the lower GROUND TERMINAL in the POWER ENTRANCE BOX.

i. Saturate the ground around the rod with water to keep it moist.

j. If a generator set is used to supply alternating-current (ac) power, ground it in the same manner as the assemblage.

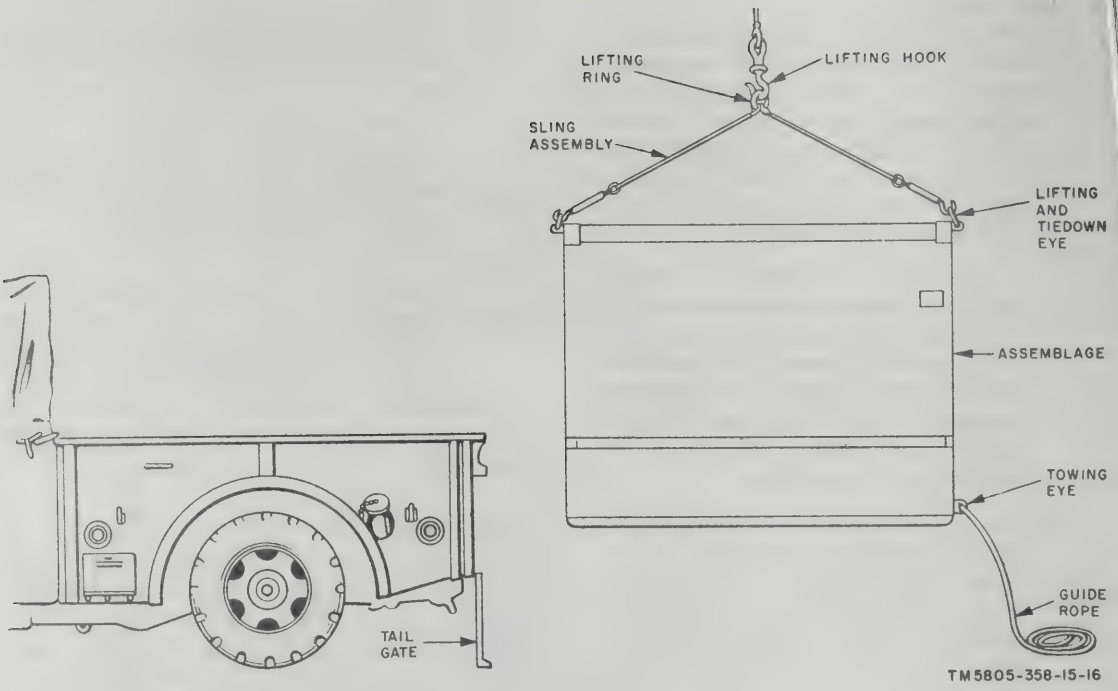


Figure 2–2. Lifting and loading AN/TRC–109(V) on truck.

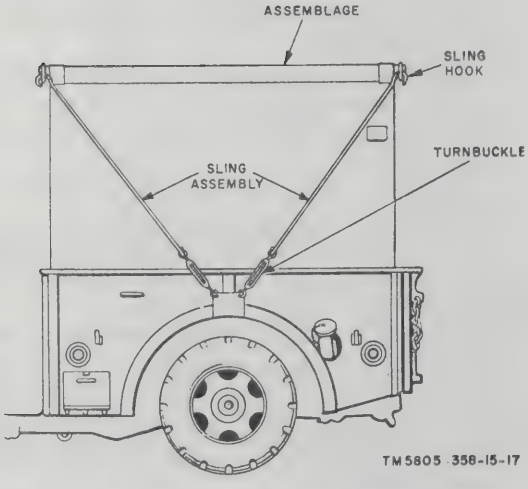


Figure 2–3. Securing AN/TRC–109(V) on truck.

2–4. Power Connections

Caution: **Grounding connections (para 2–3) must be completed *before* power is connected to the AN/TRC–109(V).**

a. Preliminary Procedures.

(1) Make sure that all circuit breakers and equipment power switches in the assemblage are in the *off* position.

(2) Remove the power cable assembly and cable reel from the PU–626/G.

(3) Unwind the power cable assembly and power cable stub from the cable reel.

Caution: **Power for the AN/TRC–109(V) normally is supplied through the POWER 115V AC IN connector. The POWER 115V AC OUT connector is provided to supply power to another assemblage or to supply power to the AN/TRC–109(V) if the POWER 115V AC IN connector is damaged. When the POWER 115V AC OUT connector is used to supply power to another assemblage, do not allow the total current drain to exceed 60 amperes (current rating of power cable assembly between AN/TRC–109(V) and power source.**

b. Connection to Generator Set. If a generator set is used to provide power to the AN/TRC–109(V), connect power to the assemblage as described in (1) and (2) below; otherwise, connect power as described in *c* below.

(1) Remove the cover from the 115V AC POWER IN receptacle in the POWER ENTRANCE BOX (fig. 1–12) and from the connector on one end of the power cable assembly. Connect the power cable assembly to the 115V AC POWER IN receptacle.

(2) If the generator set includes an output connector that is compatible with the connector on the power cable assembly, connect the power cable assembly to the generator set; otherwise, refer to the generator set manual and connect the red and white (neutral) and black (hot) leads of the power cable stub to the appropriate output terminals of the generaset. Connect the power cable stub to the power cable assembly.

c. Connection to Central Power Source.

(1) Turn off or disconnect the central power source before making any connections.

(2) If the power source is a 120-volt, 50- to 60-cycle-per-second (cps), single-phase, two-wire source, connect the red and white wires of the power cable stub to the neutral wire, and the black wire of the power cable stub to the hot wire.

(3) If the power source is a 110- to 220-volt, 50- to 60-cps, single-phase or two-phase, three-wire distribution system, connect the red and white wires of the power cable stub to the neutral terminal, and the black wire to either of the two hot terminals.

(4) If the power source is a 110- to 220-volt, 50- or 60-cps, three phase, four-wire distribution system, connect the red and white wires of the power cable stub to the neutral bus bar, and the black wire of the power cable stub to the phase 1, phase 2, or phase 3 bus bar.

(5) Connect the power cable stud to one end of the power cable assembly. Connect the other end of the power cable assembly to the POWER 115V AC IN receptacle in the POWER ENTRANCE BOX (fig. 1–2) on the assemblage.

2–5. Installation of Antenna System

a. Removal From PU–626/G Trailer (figs. 1–3 and 1–4).

(1) Lower the trailer tailgate.

(2) Remove Reels, Cable RC–436/GRC from the trailer.

(3) Remove both Antennas AT–903/G from their mountings in the trailer.

(4) Remove Bag Assembly BG–106A from the trailer.

***Warning:* The AB–577/GRC weighs over 200 pounds and is cumbersome to handle. At least two men should handle the AB–577/GRC together to avoid injury.**

(5) Unfasten the screw that secures the AB–577/GRC to the trailer shelf and slide the AB–577/GRC off the shelf from the rear of the trailer.

(6) Check the contents of the BG–106A to make sure that all parts required for the antenna erection are available.

b. Layout and Installation of Guy Anchors (fig. 2–4).

(1) Drive a Stake GP–2 (mast location stake) approximately halfway into the ground at the spot selected for the mast location.

(2) Slip one loop of the 30-foot leg of the radius rope over the mast location stake and extend it in the direction the AT–903/G (fixed AT–903/G on the AB–957/GRC when both AT–903/G's are used) will face. Drive a second GP–2 (first guy anchor) into the ground at the 30-foot point to act as a marker (A, fig. 2–4).

(3) Slip the end loop of the 52-foot section of the radius rope over the first guy anchor. Locate the point at which both sections of the rope are taut on the right side of the mast location stake and drive a third GP–2 (second guy anchor) into the ground (B, fig. 2–4).

(4) Locate the point on the opposite side of the mast location stake where both sections of the radius rope are taut and drive a fourth GP–2 (third guy anchor) into the ground (C, fig. 2–4).

(5) Remove the GP–2's and drive Stakes GP–113/G into the ground at the locations of the first, second, and third guy anchors with the rings of the GP–113/G's pointing toward the mast location stake. Angle the GP–113/G's into the ground at about a 60° angle, away from the mast location stake, and drive them in until the three rings are just above the ground.

c. Preparation of Launcher.

(1) Position the bottom of the launcher at the mast location stake with the top of the launcher facing away from the direction of the first guy anchor. Remove the mast location stake.

(2) Install a GP–2 in the holes in each side of the launcher base, to act as a hinge when the launcher is raised.

(3) Drive a GP–2 into the ground in front of each of the GP–2's in the launcher base.

(4) Release the catches holding the mast section carrier in the launcher and lift the mast section carrier out of the launcher.

(5) Remove one mast section from the mast section carrier and then use the mast section carrier to support the top of the launcher assembly in a convenient working position for assembling the AB–957/GRC and AT–903/G's to the mast.

d. Polarization and Elevation-Depression Adjustment for AT–903/G.

(1) Check to see that the mounting frames of the AT–903/G's are attached to provide proper polarization. The arrow

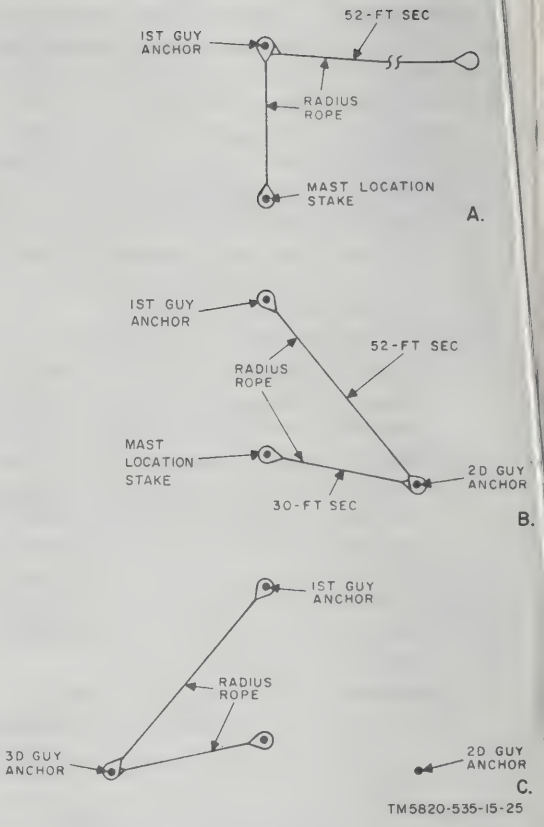


Figure 2–4. Layout of guy anchor stakes.

on the back of the AT–903/G will indicate the element polarization when mounted.

(2) Determine the proper elevation-depression angle for the AT–903/G's from the chart in figure 5–2. Refer to a local topographical map to determine the relative elevations of the sites and the distance between them.

(3) Release the locking handle on the AT–903/G elevation-depression bracket and elevate it or depress it as required.

(4) Lock the handle in position.

e. Assembly of Antenna AT–903/G.

(1) Remove the locking pin from the rear of the launcher assembly elevator and secure the pin to prevent tangling during assembly.

(2) Remove the pin from the launcher assembly handbrake handle and insert the mast section, bottom first, through the top of the launcher assembly.

(3) Remove the locking pin from the locking bar of the winch cable reel and lock the bar in the open position. Slightly lower the elevator platform on the launcher and push the mast section until it engages the base bearing. Lock the handbrake.

Note. If one AT–903/G is to be mounted on the AB–577/GRC, attach it according to the procedure in (4) below. If two AT–903/G's are to be mounted, using Support, Antenna AB–957/GRC, perform the procedures in (5) through (11) below.

(4) Place an open mast section clamp over the top of the mast section and attach Antenna AT–903/G to the mast section. Make sure that the antenna is properly polarized and that the AT–903/G is set at the proper elevation or depression angle. Align the AT–903/G so that it points in the direction of the first guy anchor (GP–113/G) and tighten the mast section clamp.

(5) Attach the antenna adapter (fig. 2–5) to the top mast section with a mast section clamp so that the slot in the adapter is in line with the direction of the first guy anchor (GP–113/G).

(6) Remove the locking pin from the hole in the center bar and remove the antenna mount secured by it. (The antenna mount is stored in this position during shipment and storage.

(7) Replace the locking pin in the hole in the center bar.

(8) Slip the top guy ring over the antenna mount so that the guy lugs angle toward the mast.

(9) Slide the center bar of the AB–957/GRC onto the antenna mount and rotate the AB–957/GRC until the locking pin engages the slot in the mount. The AB–957/GRC should be at right angles to the direction of the first guy anchor (GP–113/G).

(10) Mount one AT–903/G (facing in the proper direction) on the fixed antenna mount of the AB–957/GRC. Rotate the AT–903/G until the pin in the base engages the slot in the antenna mount.

(11) Slip the antenna mount removed from the center bar in (6) above onto the nonlocking mounting of the AB–957/GRC. Mount the second AT–903/G on the antenna mount and rotate the AT–903/G until the pin in its base engages the slot in the mount.

f. Attaching Guys (figs. 2–6 and 2–7).

(1) Attach the snubber ends of two of the launcher guys (coded blue) to the second and third anchor stakes (GP–113/G's). Attach the other ends of the guys to the guy holes in the top of the launcher. Adjust the lengths of these guys to approximately 36 feet.

(2) Attach the top end of the third launcher guy (coded blue) to the remaining hole in the top of the launcher. Do not attach the snubber end of this guy.

(3) Attach the three top guys (coded red) to the top guy ring on the AT–903/G (for single installations), or on the antenna adapter guy ring if the AB–957/GRC is used. Do not attach the lower ends of the top guys.

(4) If the AB–957/GRC is used, attach two 65-foot guys (coded red) to each guy attachment on the ends of the AB–957/GRC horizontal bar (fig. 2–5).

(5) Attach two 65-foot guys (coded red) to the support frame of the free-moving AT–903/G on the AB–957/GRC so that it can be moved from the ground after the mast is erected.

g. Erection of Launcher.

(1) Raise the launcher to the vertical position (fig. 2–6). The launcher will stand unsupported if the base is level. Attach the loose launcher guy to the first guy anchor (GP–113/G).

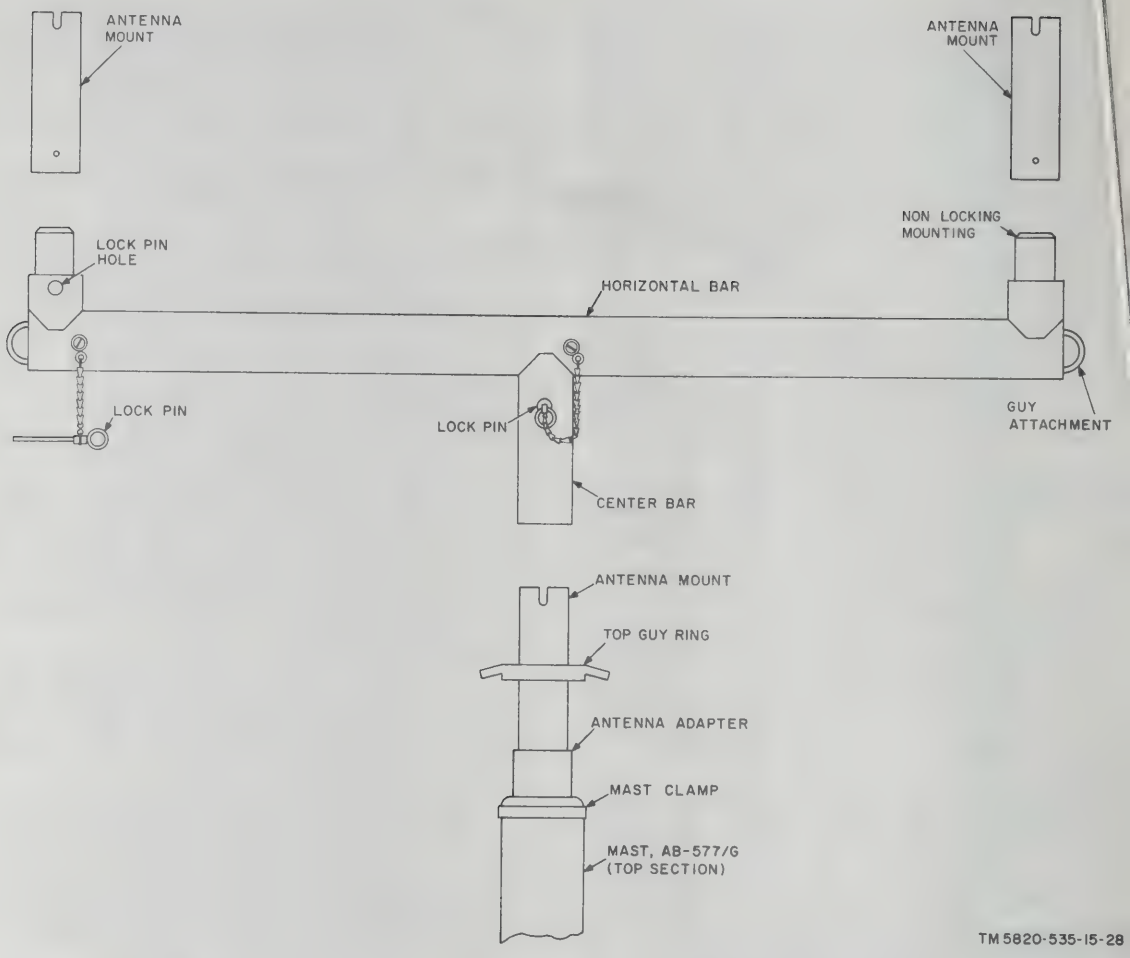


Figure 2–5. Assembly of Support, Antenna AB–957/GRC on Mast AB–577/GRC.

(2) Drive two GP–2 stakes through the holes in the base of the launcher and into the ground to prevent the launcher from shifting position. Do not drive the GP–2's completely into the ground. Remove the GP–2's installed in the sides of the launcher (*c*(2) above).

(3) Remove the winch from the accessory bag and install it on the launcher frame. Slide the latch (on the rear of winch reel supporting frame) over the winch shaft to lock the winch in position. Make sure the elevator cable is properly threaded over the pulley wheels.

(4) Operate the winch to raise the elevator to the bottom of the first mast section. Drive the third GP–2 through the rear of the launcher into the ground.

(5) Check the target level on the launcher frame to see that the launcher is level. Adjust the launcher frame if necessary.

(6) Unscrew the snubber adjustment to the fully extended position on the launcher guys. Unlock the snubber clamp and take up the slack on the launcher guys. Check the target level and adjust the snubber adjustments until the launcher is level.

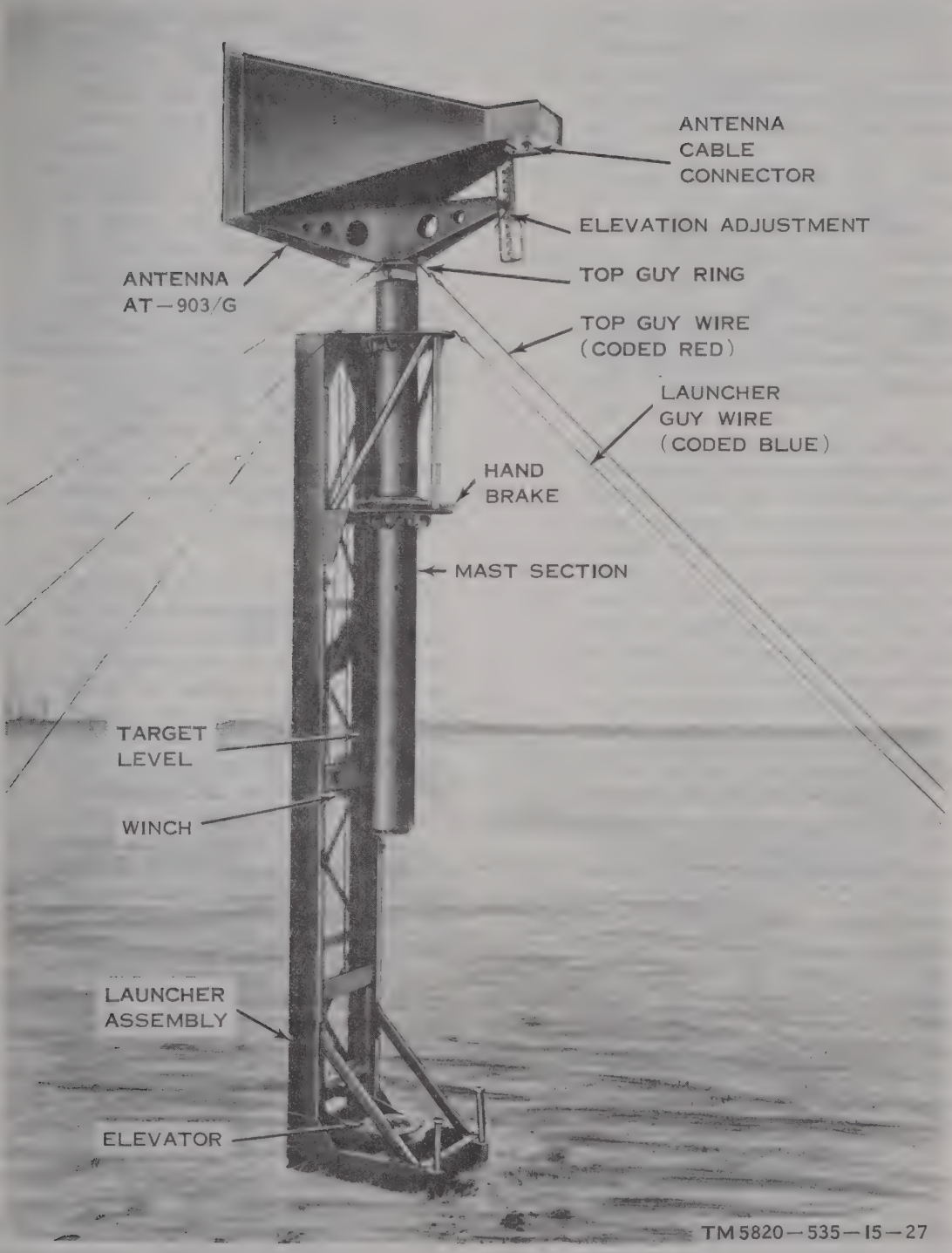


Figure 2–6. Launcher assembly in position with one mast section and AT–903/G mounted.

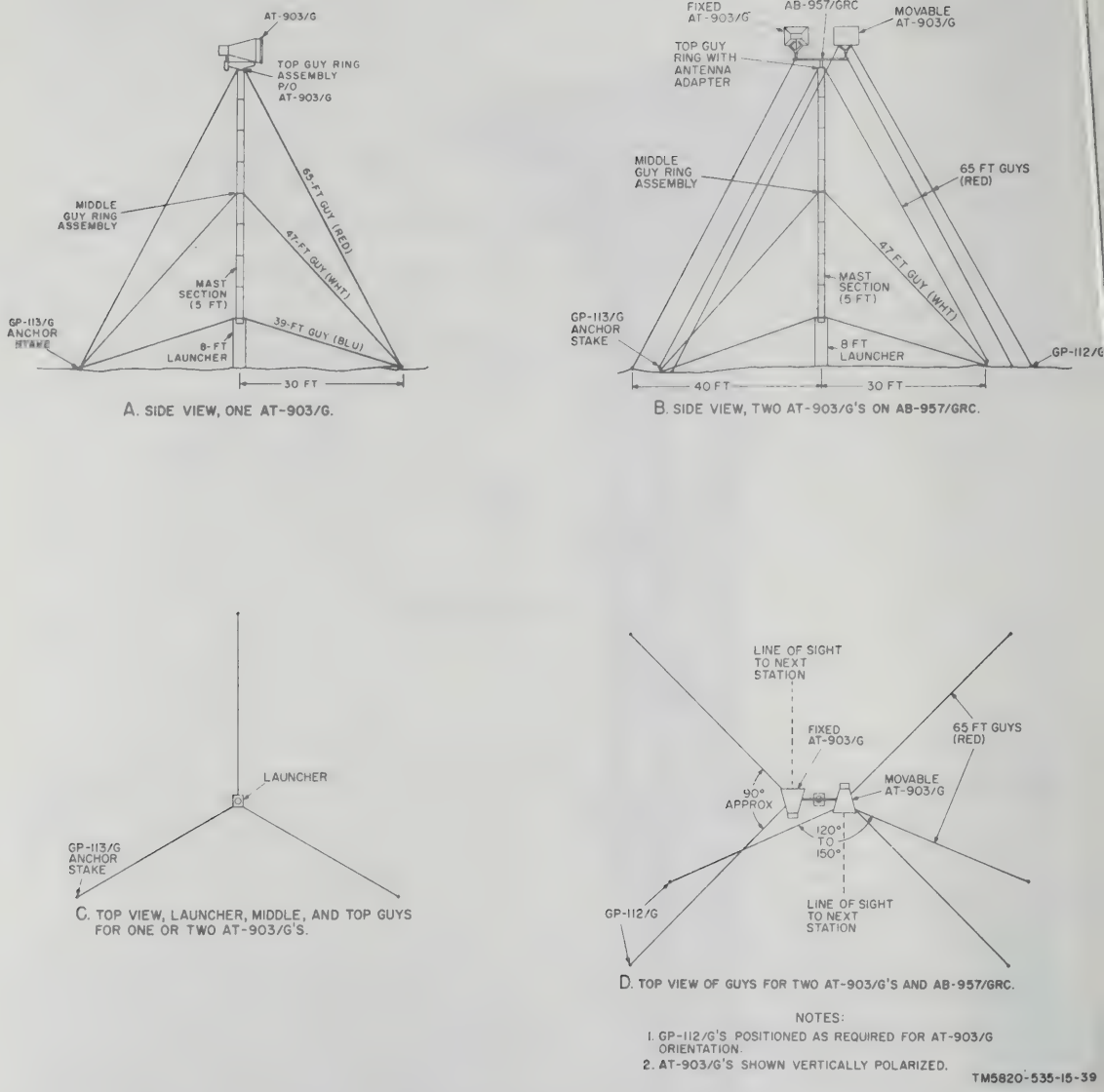


Figure 2-7. Antenna installations using one or two AT-903/G's.

(7) Drive the GP-2's in the base of the launcher frame completely into the ground. Check the level and readjust the snubber adjustments if required.

(8) Install the spanner wrench from the accessory bag in the base of the launcher to act as a foot lever.

h. Attaching Antenna Cables.

Note. If the AB-957/GRC is used, connect both sets of cables according to the procedures in (1) through (4) below.

(1) Connect Cable Assembly, Radio Frequency CG-781B/U (6 ft) to the cable connector on the AT-903/G.

Use the rear of the launcher frame as a ladder to reach the connector.

(2) Attach Adapter, Connector UG–1374/U to the lower end of the CG–718B/U (6 ft).

(3) Connect Cable Assembly, Radio Frequency CG–1859/U (80 ft) to the UG–1374/U. Attach the snap fastener of the CG–1859/U cable grip to the top guy ring.

(4) Set up Reel, Cable RC–436/GRC so that the CG–1859/U comes off freely as the mast is raised.

i. Raising Mast AB–577/GRC.

(1) Release the handbrake and operate the winch to raise the mast section to the upper limit. The elevator stop will determine the upper limit.

Caution: **Always lock the handbrake securely before lowering the elevator and attaching the next mast section.**

(2) Operate the winch to lower the elevator to its lowest position.

(3) Slip an open mast section clamp over the bottom joint of the mast section. Do not tighten the mast section clamp.

(4) Remove the next mast section from the mast section carrier and set it in place on the elevator. Make sure that the mast section seats properly on the elevator platform.

(5) Step on the foot lever (spanner wrench (*g*(8) above)) and raise the platform until the mast section meets the bottom of the mast section above it. Position the mast section clamp at the joint and lock it securely.

(6) Raise the elevator about 2 inches with the winch until the mast section rests on the elevator platform. Repeat the procedures in (1) above.

(7) Repeat the procedures in (2) through (6) above until the fifth mast section is raised about halfway, and then lock the handbrake.

(8) Climb the rear of the launcher assembly and install the middle guy ring assembly between the fourth and fifth mast sections.

(9) Insert the locking pin through the holes in the guy ring assembly to lock it in place.

(10) Connect the top ends of the middle guy wires (coded white) to the middle guy ring. Do not attach the snubber ends.

(11) Release the handbrake and operate the winch to raise the fifth mast section to the upper limit.

(12) Repeat the procedures in (2) through (6) above until the eighth mast section is raised. Align the yellow arrows on the eighth mast section and the elevator platform to insure that the mast section has engaged base bearing.

Caution: **In winds exceeding approximately 25 miles per hour (mph), hold the upper guys taut during erection. When the antenna is fully erected, it can withstand winds up to 100 mph. If wind velocities *in excess* of 100 mph are normal for the site, reduce the height of the AB–577/GRC. The reduced height must be taken into account when determining the elevation-depression angle of the AT–903/G (*d* above).**

(13) When the last mast section is raised, securely fasten the handbrake.

(14) Secure the upper and middle guys to the upper and middle guy rings on the anchor stakes (GP–113/G's), and snub them loosely.

(15) If the AB–957/GRC is used, extend the guys attached to the guy attachments and attach them to GP–112/G stakes and drive the GP–112/G's into the ground (D, fig. 2–7). Attach the guys connected to the free-moving AT–903/G to GP–112/G's and drive them into the ground. Do not tighten the snubbers on the AB–957/GRC and AT–903/G guys.

(16) Remove the foot lever from the base of the launcher.

(17) Install the mast section carrier into the launcher to act as the base section of the mast.

(18) Lock the mast section carrier in place by closing the catches on the launcher frame.

(19) Release the handbrake and operate the winch to lower the mast until its complete weight rests on the mast section carrier. There should be no tension in the elevator cable. Lock the handbrake securely.

j. Final Adjustments.

(1) Make sure that there is plently of slack in the top and middle guy wires.

(2) Check the level of the launcher with the target level. If necessary, adjust the launcher guys to level the launcher.

(3) Adjust the tension on the middle guy wires until the lower half of the mast is straight.

Note. To check the vertical alignment of the AB–577/GRC, observe it from a distance and compare it with a known vertical object.

(*a*) Unscrew the snubber adjustment to its fully extended position.

(*b*) Unlock the snubber clamp and take up the slack in the guy.

(*c*) Correct any misalignment in the AB–577/GRC by tightening the snubber adjustment.

(4) Repeat the procedures in (3) above for the top guys.

(5) Recheck the level of the mast with the target level. Make sure that the guys are tight and secure.

(6) Attach Cable Assembly, Radio Frequency CG–1859/U (80 ft) to a guy stake to prevent damage in a wind.

(7) If the CG–1859/U (80 ft) is not long enough to reach the AN/TRC–109(V), attach Adapter, Connector UG–1373/U to the CG–1859/U (80 ft) and attach the CG–1859/U (40 ft) to the UG–1373/U to extend the length of the cable. Interlock the strain relief cable grips on the CG–1859/U (80 ft) and CG–1859/U (40 ft) to relieve any strain on the connectors.

2–6. Antenna and Video Cable Connections

All external pcm and antenna cable connections are made at the VIDEO & ANTENNA ENTRANCE boxes on the roadside and curbside walls of the assemblage. The system 1 connections are made on the roadside and the system 2 connections are made on the curbside (figs. 1–1 and 1–2).

a. Antenna Cable Connections (fig. 1–13).

(1) Remove the cover from the antenna receptacle and from the free end of the CG–1859/U (80 ft) or CG–1859/U (40 ft).

(2) Attach a strain relief cable grip to the antenna cable approximately 5 feet the connector end. Attach the cable grip to the bridle ring next to the antenna receptacle in the VIDEO & ANTENNA ENTRANCE box.

(3) Attach the connector on the end of the cable to the antenna receptacle in the VIDEO & ANTENNA ENTRANCE box. Check to see that there are no kinks or sharp bends in the cable.

b. Pcm Cable Connections. Connect Cable, Special Purpose, Electrical CX–4245/G, or equivalent, to the paired video receptacles in the VIDEO & ANTENNA ENTRANCE boxes as follows:

(1) Slip a cable grip (supplied with the cable) through the bridle ring (fig. 1–13) or through a lifting and tiedown eye or towing eye of the assemblage.

(2) Wrap the cable grip on the cable far enough from the connectors to form a loose loop after the cable is connected to the receptacles (at least 5 feet from the connector end).

(3) Attach the male and female connectors on the CX–4245/G, or equivalent, to the receptacles in the VIDEO & ANTENNA ENTRANCE boxes. Tighten the connections by turning the rubber sleeve on the connector or receptacle.

(4) Connect a ground strap between the outside shield lug of the CX–4245/G and a ground terminal in the VIDEO & ANTENNA ENTRANCE box or in the POWER ENTRANCE box.

2–7. Interunit Cable Connections

a. Common Connections. The interunit cable connections common to all applications of the AN/TRC–109(V) are shown in the signal schematic wiring diagram in figure 5–4. Check to see that all common connections are properly made.

b. Application Connections. To connect the AN/TRC–109(V) as an fdm radio repeater, connect the two R–1331(P)/GRC's and the two PP–2054/GRC's as shown in figure 2–8. To connect the AN/TRC–109(V) as a pcm cable repeater connect the cables shown in figure 2–9. To connect it as a pcm cable-to-radio conversion, connect the cables shown in figure 2–10. To connect it as a pcm radio repeater, connect the cables shown in figure 2–11.

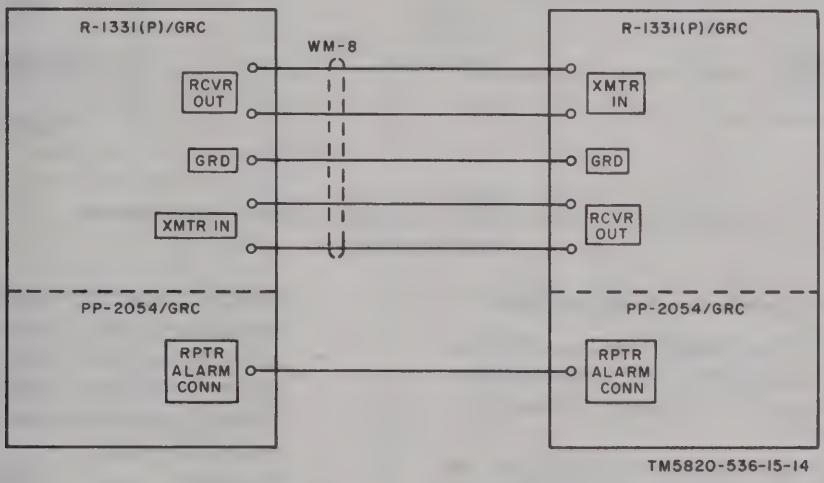


Figure 2–8. Fdm radio repeater, interunit connection diagram.

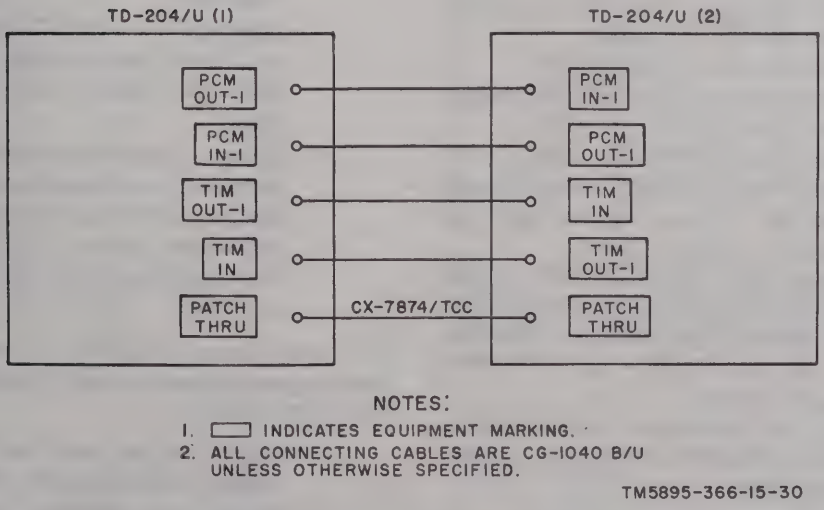


Figure 2–9. Pcm cable repeater, 12/24/48 channels, interunit connection diagram.

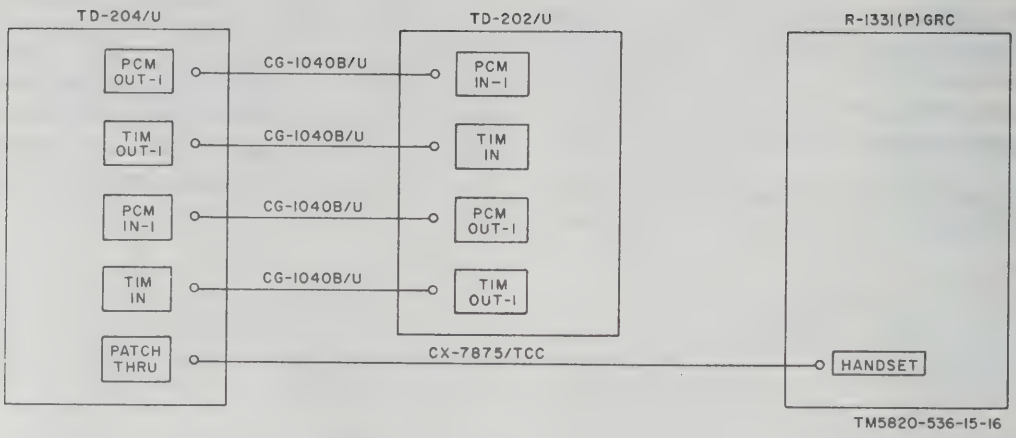


Figure 2–10. Pcm cable-to-radio conversion, 12/24 channels, interunit connection diagram.

2–8. Equipment Checks and Adjustments

Apply power to the assemblage according to the procedures in paragraph 3–2 and then perform the procedures in *a* through *i* below.

a. TA–312/PT.

(1) Install two Batteries BA–30 in the battery case of the TA–312/PT, one facing up and the other down.

(2) Operate the CB-LB-CBS switch to LB.

(3) Insert the plug from the TA–312/PT into the PHONE jack.

b. Voltage Regulator CN–514/GRC.

(1) Check to see that the POWER switch on the CN–514/GRC is OFF.

(2) Operate the POWER DISTRIBUTION PANEL EQUIP circuit breakers to ON. Check to see that the associated indicator lights.

(3) Operate the CN–514/GRC MANUAL-AUTOMATIC switch to MANUAL. Operate the POWER switch to ON; the MANUAL and POWER indicators light.

(4) Check the indication on the REGULATED OUTPUT VOLTAGE meter CN–514/GRC.

(5) If the meter indicates less than 115 volts, operate the RAISE-LOWER switch to RAISE until the meter indicates precisely 115 volts. If the meter indicates more than 115 volts, operate the RAISE-LOWER switch to LOWER until the meter indicates precisely 115 volts.

(6) Operate the MANUAL-AUTOMATIC switch to AUTOMATIC; check to see that the REGULATED OUTPUT VOLTAGE meter indicates 115 volts.

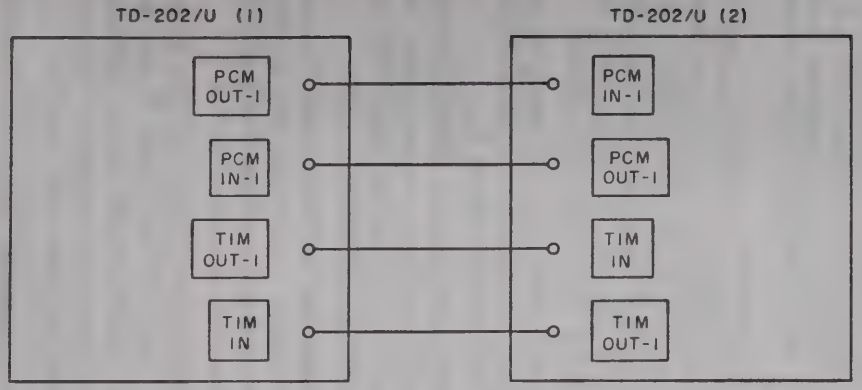
(7) Operate the POWER switch to OFF and then back to ON. Check to see that the meter still indicates 115 volts.

(8) Check to see that the POWER switches on all rack equipments are operated to OFF. Operate the overvoltage protective device POWER switch to ON and release it; the power indicator lights.

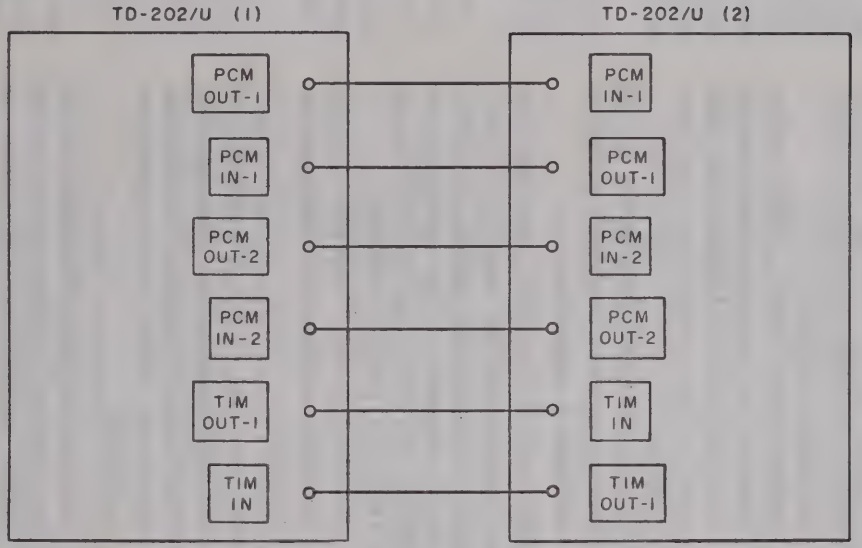
c. Multiplexer TD–202/U. Perform the following procedures on both TD–202/U's in the AN/TRC–109(V).

(1) Check to see that the AC POWER switch is operated to OFF.

(2) Operate the METER SELECT switch to SERV FAC.



A. 12-CHANNEL



B. 24-CHANNEL

NOTES:

1. CONNECT FIELDWIRE BETWEEN [RPTR ALARM] [CONN] TERMINALS ON PP-2054/GRC (1) AND PP-2054/GRC (2
2. ALL CONNECTING CABLES SHOWN ARE CG-1040B/U.
3. [ ] INDICATES EQUIPMENT MARKING

TM5895-366-15-28

Figure 2–11. Pcm radio repeater, 12/24 channels, interunit connection diagram.

(3) Press the PUSH TO RELEASE CHASSIS button and slide the TD–202/U out of its case to expose the service facility panel.

(4) Operate the TRAFFIC SEL switch to the position corresponding to the traffic capacity o f the system as follows:

12-channel radio repeater	12.
24-channel radio repeater	24R.
12-channel cable-radio conversion	12.
24-channel cable-radio conversion	24R.
12/24/48-channel cable repeater	48A.
12-channel cable-radio conversion	12.
24-channel cable-radio conversion	48A.

(5) Operate the OPR-TEST switch to OPR.

Note. If the buzzer sounds during the following procedures, operate the ALARMS BUZZER OFF switch to silence the buzzer.

(6) Operate the AC POWER switch to ON; check to see that the AC POWER indicator lights.

(7) Operate the SERV SEL switch through +10, +4.5, and –4.5; check to see that the TEST ALIGN meter indicates in the yellow area for each position.

(8) Operate the SERV SEL switch to –12; check to see that the TEST ALIGN m indicates in green area.

d. Multiplexer TD–204/U. Perform the following procedures on each TD–204/U connected in an operating system. If a TD–204/U is not connected in an operating system, perform the procedurse in (1) through (6) and (12), (13), and (14) below.

(1) Operate the AC POWER, CABLE POWER, and TALK-OFF-SIG switches to OFF.

(2) Depress the PUSH TO RELEASE CHASSIS button and slide the TD–204/U out of its case, far enough to expose the service facility panel and panel 6A4.

(3) Operate the TRAFFIC SEL switch to the position corresponding to the traffic capacity of the system as follows:

(4) Operate the NORM OPR–ZERO SET READ switch to NORM OPR.

(5) Operate both MILES switches on th service facility panel to 0.

(6) Operate the panel 6A2 TONE-OFF switch to OFF.

(7) Operate the MILE switches on panels 6A4 and 6A5 to the position corresponding to the distance to the first TD–206/G in the transmission cable.

Note. If the TD–204/U is connected to another TD–204/U less than 1 mile away, and no TD–206/G's are used between them, operate both MILE switches on one end to 1 MILE and both MILE switches on the other end to the actual distance between them.

(8) Operate the AC POWER switch to ON. Check to see that the AC POWER and ALARMS NO CABLE CURRENT indicators light and the buzzer sounds. Silence the buzzer with the ALARM BUZZER OFF switch.

Note. If the buzer sounds during the following procedures, press the ALARMS BUZZER OFF switch to silence it.

(9) Operate the CABLE POWER switch to ON. Check to see that the ALARM NO CABLE CURRENT indicator is extinguished.

(10) Operate the METER SELECT switch to CABLE I and check for a yellow area indication on the TEST ALIGN meter.

(11) Operate the METER SELECT switch to CABLE V and check to see that the TEST ALIGN meter indicates 11.3 times the number of TD–206/G's in the cable link, plug 17.

(12) Operate the METER SELECT switch to SERV FAC.

(13) Operate the SERV SEL switch through –10, +10, SUM ±3, and BAL and check for a yellow area indication on the TEST ALIGN meter for each position.

(14) Operate the SERV SEL switch to RCC and check for a green area indication on the TEST ALIGN meter.

e. Radio Set AN/GRC–50A(V).

(1) Check to see that the proper receiver and transmitter heads are installed as assigned for the assemblage.

(2) If the AN/GRC–50A(V) components are connected in an operating system, and the antennas are installed, erected, and connected, turn on the components and tune them; follow the procedures in paragraph 3–4.

(3) If the AN/GRC–50A(V) components are not connected in an operating system, connect a CG–718B/U between the T–893(P)/GRC TO ANT receptacle and Dummy Load, Electrical DA–189/GRC, and tune the components to the assigned standby frequency. If no standby frequencies are assigned, tune the spare components to the same frequencies assigned to the operating components.

(4) After the procedures of paragraph 3–4 are completed, reconnect the T–893(P)/GRC TO ANT receptacle to the DA–189/GRC.

(5) Operate the R–1331(P)/GRC meter selector switch to TEST TONE CAL.

(6) Operate the R–1331(P)/GRC TEST TONE switch to ON and adjust the TEST TONE control for an indication of 25 on the R–1331(P)/GRC multimeter.

(7) Operate the T–893(P)/GRC multimeter selector switch to 1 KC MOD and check for a green area indication on the multimeter.

(8) Operate the T–893(P)/GRC multimeter selector switch to PWR OUT.

(9) Adjust the AM–1957/GRC or AM–1958A/GRC POWER OUT control for a 5-watt (high-band) or 11-watt (low-band) indication on the T–893(P)/GRC multimeter.

(10) Adjust the T–893(P)/GRC ALARMS ADJ control until the LOW POWER indicator lights and the buzzer sounds. Silence the buzzer with the BUZZ OFF switch.

(11) Adjust the AM–1957/GRC or AM–1958A/GRC POWER OUT control for a maximum power indication on the DA–189/GRC meter. The T–893(P)/GRC LOW POWER indicator should extinguish.

f. AN/GRC–50A(V) Order-Wire Adjustment.

(1) Operate the PP–2054/GRC OPERATE-STANDBY switch to STANDBY. Disconnect the CG–718B/U between the T–893(P)/GRC TO ANT receptacle and the DA–189/GRC. Reconnect the antenna cable to the TO ANT receptacle.

(2) Operate the PP–2054/GRC OPERATE-STANDBY switch to OPERATE.

(3) Operate the R–1331(P)/GRC meter selector switch to 1 KC OUT.

(4) Contact the next station on the order wire and request a test tone.

(5) Adjust the R–1331(P)/GRC FDM OUTPUT LEVEL control for a green area indication on the multimeter.

(6) Operate the meter selector switch to ORDER WIRE and check the meter for a green area indication.

g. Antenna Orientation (one AT–903/G).

Note. These adjustments are for azimuth correction only. Two men are required to perform the adjustments. Elevation adjustments must be made with the mast lowered, and should be completed before the mast is raised.

(1) Connect the operator at the next station on the order wire.

Note. The following procedures should be performed by the operators of both stations at the same time.

(2) Operate the R–1331(P)/GRC multimeter selector switch to REC SIGNAL.
(3) Adjust the position of the antenna mast by having one man rotate the mast 15° from the original position, in both directions, while the second man observes the indication on the R–1331(P)/GRC multimeter. Position the mast for a peak indication on the multimeter.
(4) Tighten the snubbers on all antenna guys and secure them.

h. Antenna Orientation (Two At–903/G's on AB–957/GRC).

(1) Perform the procedures in *g* above for the fixed AT–903/G on the AB–957/GRC.
(2) Secure the four guy wires attached to the guy attachments on the AB–957/GRC to GP–112/G stakes and drive the stakes into the ground. Keep the guys on each side separated by approximately 90° (D, fig. 2–7). Tighten the guys sufficiently to hold them in position; do not overtighten them.
(3) Point the movable AT–903/G (using the guys attached to it) in the approximate direction of the distant terminal or repeater.
(4) Connect the distant terminal or repeater on the order wire.
(5) Operate the R–1331(P)/GRC multimeter selector switch to REC SIGNAL.
(6) Adjust the position of the AT–903/G by having one man swing the AT–903/G with the guys attached to it, while the second man observes the indication on the R–1331(P)/GRC multimeter. Position the AT–903/G for a peak indication on the multimeter.
(7) Secure the guys attached to the AT–903/G to GP–112/G stakes driven into the ground so that the two guys form an angle between 120° and 150°. Tighten the snubbers to secure the AT–903/G in position. Do not overtighten the snubbers.

i. Squelch Alarm Adjustment on 1331(P)/GRC.

(1) Operate the R–1331(P)/GRC me selector switch to REC SIGNAL.
(2) Adjust the REC SIG-1 control Amplifier - Converter AM – 1955 GRC or AM–1956A/GRC until t signal is just audible in Handset H 156/U.
(3) Adjust the SQUELCH INCR SEN control until the SQUELCH NO SIG NAL indicator lights and the buzze sounds. Silence the buzzer with th SQUELCH BUZZER OFF switch.
(4) Readjust the AM–1955A/GRC or AM–1956A/GRC REC SIG–1 control for a maximum indication on the meter. Note that the SQUELCH NO SIGNAL indicator extinguishes and the buzzer sounds. Silence the buzzer with the SQUELCH BUZZER OFF switch.

2–9. System Alignment

a. Radio Link Order Wire. After order-wire communications are established with the distant terminal or repeater, perform the following procedures on the TD–202/U.

(1) Request a test tone from the distant terminal or repeater. Operate the TD–202/U TEST TONE switch to ON.

Note. Perform the following procedures at both ends of the radio link, at the same time.

(2) Operate the METER SELECT switch to SERV FAC and the SERV SEL switch to 0.
(3) Adjust the ORDER WIRE LEVEL control for a center hairline indication on the TEST ALIGN meter.
(4) Turn off the test tones and check the order-wire communications for proper volume.

b. Cable Link Order Wire. Perform the following procedures on both TD–204/U's at the ends of the cable link, at the same time.

(1) Connect a Headset-Microphone H–91A/U to the HEADSET receptacle.
(2) Momentarily operate the TALK-OFF-SIG switch to SIG, and then to TALK.

(3) After communication is established through the cable link, operate the METER SELECT switch to SERV FAC the SERV SEL switch to Q.

(4) Operate the TONE-OFF switch on panel 6A2 to TONE.

(5) Instruct the distant operator to adjust the CRL control on his TD-204/U panel 6A2 for a center hairline reading on his TEST ALIGN meter.

(6) Operate the TONE-OFF switch to OFF and request the distant operator to send the tone.

(7) Adjust the CRL control on panel 6A2 for a center hairline indication on TEST ALIGN meter.

(8) Instruct the distant operator to stop the test tone. Check the volume of the order-wire communication with the distant operator.

c. TD-202/U Output Video Level.

(1) Operate the TD-202/U METER SELECT switches at both ends of the radio link to TO RADIO XMTR.

(2) Adjust the TD-202/U panel 5A2 OL controls at both ends of the radio link for a center hairline indication on the TEST ALIGN meter.

d. TD-202/U Input Video Level.

(1) Operate the TD-202/U METER SELECT switches at both ends of the radio link to FROM RADIO RECEIVER.

(2) Adjust the TD-202/U panel 5A3 RL controls at both ends of the radio link for a center hairline indication on the TEST ALIGN meter.

Note. Perform the following for 24-channel operation only.

(3) Operate the TD-202/U METER SELECT switch to SERV FAC and the SERV SEL switch to C. Adjust the panel 5A3 CL control for a peak indication on the TEST ALIGN meter.

CHAPTER 3

OPERATING INSTRUCTIONS

3-1. Controls and indicators

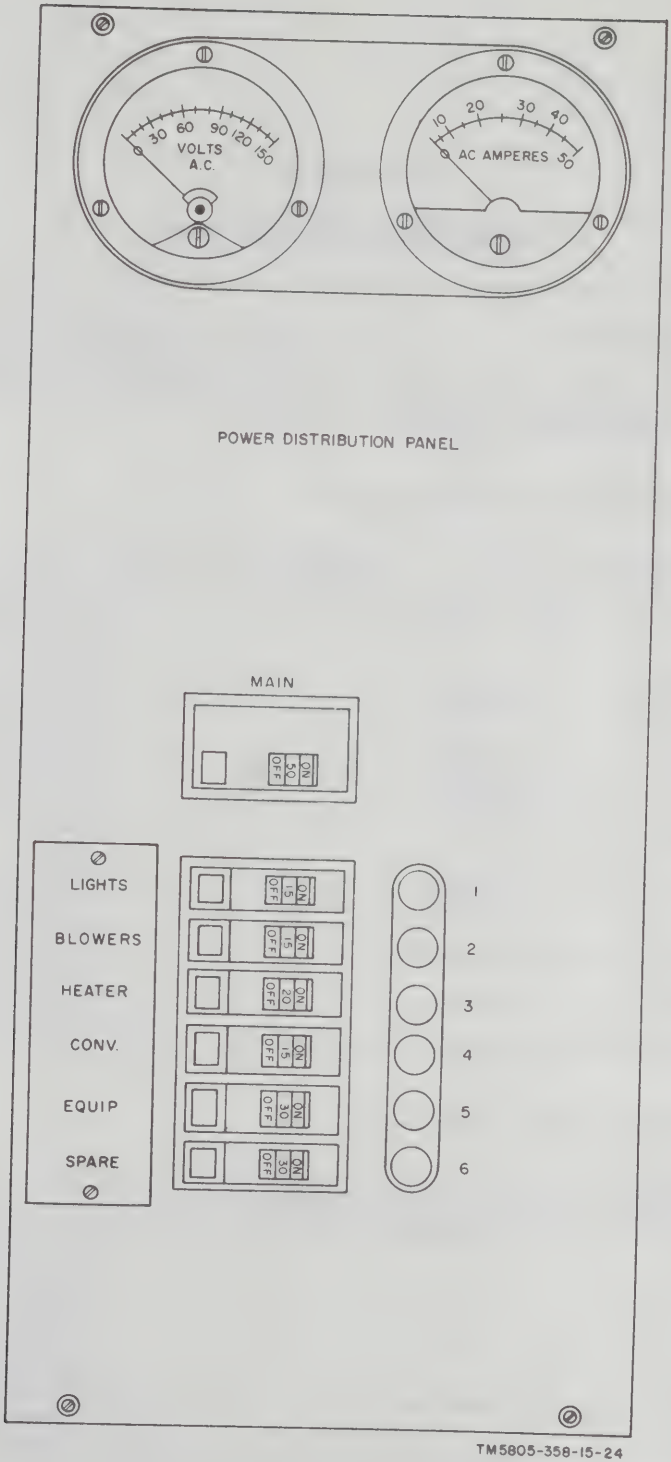
The following charts identify all controls and indicators in the assemblage ac power distribution. The controls and indicators of the equipment components installed in the assemblage are described in their respective manuals (appx A).

a. POWER DISTRIBUTION PANEL (fig.3-1).

Control or indicator	Description	Function
MAIN circuit breaker	50 amperes	Provides overload protection and control of tributary circuit breakers.
Circuit breakers (tributary):		Control following circuits:
LIGHTS	15 amperes	Ceiling lights (fluorescent and incandescent).
BLOWERS	15 amperes	Exhaust blowers.
HEATER	20 amperes	HEATER receptacle.
CONV	15 amperes	CONVENIENCE receptacles.
EQUIP	30 amperes	Unregulated input to CN-514/GRC.
SPARE	30 amperes	Not used.
A.C. VOLTS meter	0-150 vac	Indicates input voltage to assemblage.
A.C. AMPERES	0-100 amperes	Indicates total current drain in assemblage.
Indicators No. 1 through 6	NE-45	Glow when associated circuit breaker is operated to ON.

b. Overvoltage Protective Device (fig. 3-2).

Control or indicator	Description	Function
POWER switch	Momentary 3-position switch	ON position: momentary position resets power relay to apply power to rack equipment outlets. OFF position: disengages power relay to remove power from rack equipment outlets.
Power indicator	Lamp	Lights when power relay is operated and power is available at output receptacle.



Figuure 3-1. POWER DISTRIBUTION PANEL, front view.

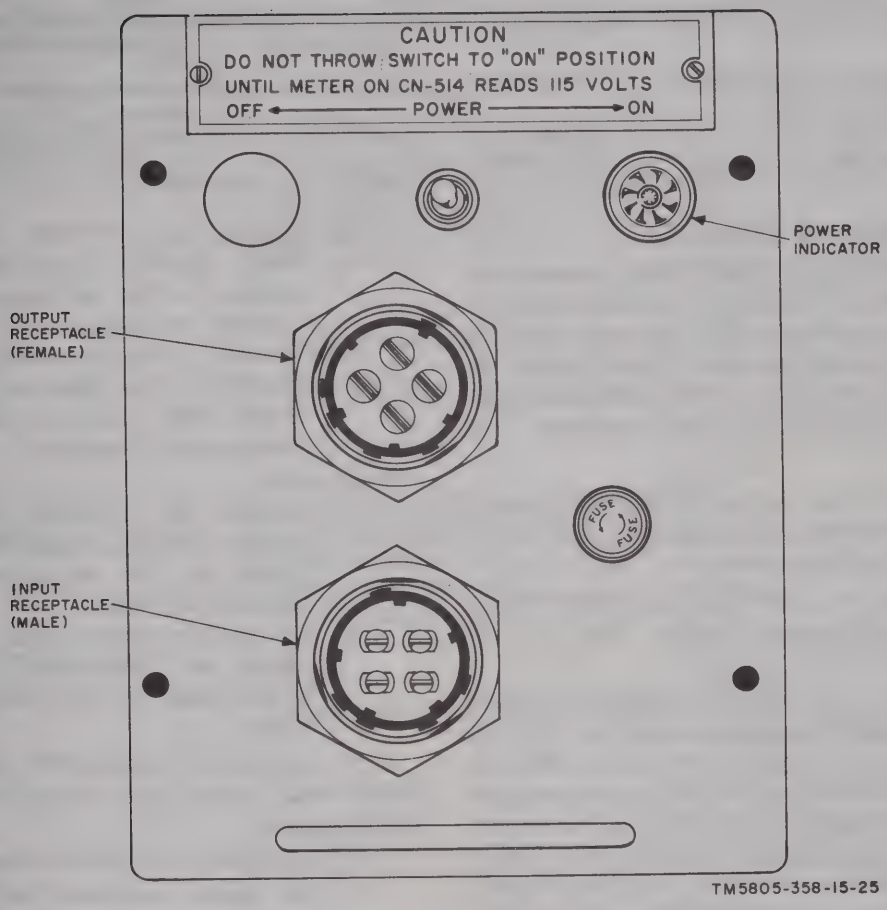


Figure 3–2. Overvoltage protective device.

c. Miscellaneous Controls and Indicators (fig. 5–1).

Control or indicator	Description	Function
POWER INDICATOR neon lamp	NE–34 neon lamp	Glows when ac power is applied to POWER ENTRANCE BOX.
Interlock switch	Microswitch	Extinguishes assemblage lights when entrance door is open and BYPASS BLACKOUT switch is at OFF.
BYPASS BLACKOUT switch	Two position	Controls assemblage lights as follows: ON position—permits assemblage light circuits to be controlled by individual switches only. OFF position—permits interlock switch to control assemblage light circuits.

Control or indicator	Description	Function
LIGHT switch	Two position	Controls fluorescent ceiling lights.
INCAND COLD START LIGHT switch.	Two position	Controls incandescent ceiling lights.
BLOWER 1 switch	Two position	Controls roadside blower.
BLOWER 2 switch	Two position	Controls curbside blower.

3–2. Energizing Ac Circuits

Caution: **If the ac power fails, be sure that the overvoltage protective device POWER switch is operated to OFF. Do not reset the overvoltage protective device until power is restored and the CN–514/GRC REGULATED OUTPUT VOLTAGE meter indicates 115 volts.**

a. If a generator set is used to supply power, start the generator; if a central power source is used, turn on the power.

b. Operate the POWER DISTRIBUTION PANEL MAIN circuit breaker (fig. 3–1) to ON.

c. Operate the POWER DISTRIBUTION PANEL LIGHTS circuit breaker to ON; the associated neon indicator will light. Operate the LIGHT switch to ON. If the temperature in the assemblage is too low for the fluorescent lights to start, operate the INCAND COLD START LIGHT switch (fig. 1–9) to ON until the assemblage is heated sufficiently for the fluorescent lights to operate.

d. If blackout conditions are required, operate the BYPASS BLACKOUT switch to OFF; otherwise, operate it to ON.

e. Check the power DISTRIBUTION PANEL A.C. VOLTS meter; it should indicate 115 volts ±11.5. Check the A.C. AMPERES meter; it should indicate less than 2 amperes.

3–3. Operating Heaters, Blowers, and TA–312/PT

a. Exhaust Blowers.

(1) Open the EXHAUST BLOWER vent cover on the outside of the front wall of the assemblage.

(2) Open the AIR FILTER cover on the outside of the entrance door.

(3) Operate the POWER DISTRIBUTION PANEL BLOWERS circuit breaker to ON; the associated neon indicator will light.

(4) Operate the BLOWER 1 and BLOWER 2 switches on the ceiling power ducts (fig. 5–1) to ON; the blowers should operate.

b. Heaters.

(1) Operate the POWER DISTRIBUTION PANEL HEATER circuit breaker to ON; the associated neon indicator will light.

(2) Operate the heater switch to ON and adjust the TEMPERATURE control on the heater for the desired temperature.

c. Telephone Set TA–312/PT. Connect the patch cord from the TA–312/PT to the PHONE jack.

(1) *Initiating call.* Lift the handset from the cradle and turn the handcrank. Press the press-to-talk switch to talk and release it to receive. Replace the handset in the cradle after the call is completed.

(2) *Answering call.* When the TA–312/PT rings, lift the handset from the cradle and listen to the receiver. Press the press-to-talk switch to talk to the calling party. Replace the handset in the cradle after the call is completed.

3–4. Operating AN/GRC–50A(V)

Caution: **In all starting procedures, the receiver components *must* be tuned before the transmitter components. The receive and transmit frequencies *must* be separated by at least 51 channels. Preset the tuning controls to their approximate assignments before applying power to the equipment.**

a. Initial Control Settings. Operate all controls on the PP–2054/GRC, R–1331(P)/GRC (including AM–1955A/GRC or AM–1956A/GRC), and T–893(P)/GRC (including AM–1957/GRC or AM–1958A/GRC) as follows:

Component	Control	Position or action
R–1331(P)/GRC	AC POWER	OFF.
	Multimeter selector	OSC.
	TEST TONE	OFF.
	FDM OUTPUT LEVEL	Midrange.
	SQUELCH INCR SENS	Maximum counterclockwise.
AM–1955A/GRC or AM–1956A/GRC	REC SIG–1	Operate to desired receive channel (indicated on respective dial).
	OSCILLATOR	Operate to desired receive channel (indicated on respective dial).
	WAVEMETER	Operate to control reading on WAVEMETER CHART corresponding to assigned channel.
PP–2054/GRC	AC POWER	OFF.
	OPERATE-STAND BY	STAND BY.
T–893(P)/GRC	AFC CORRECTION	Midrange.
	INPUT LEVELS PCM	Midrange.
	INPUT LEVELS FDM	Midrange.
	AFC selector	TUNE
	AFC TUNE	Operate for desired channel on AFC TUNE CHANNEL indicator.
AM–1957/GRC or AM–1958A/GRC	POWER OUT	Operate for desired channel on TRANSMIT CHANNEL indicator.
	MAIN TUNING	Operate to desired channel on dial indicator.
	COUPLING	Operate to desired channel on dial.
	REC SIG–2	Operate to desired channel on RECEIVE CHANNEL indicator.
	WAVEMETER	Operate to reading listed under MAIN TUNE column on WAVEMETER CHART corresponding to desired channel.

b. Regulator, Voltage CN–514/GRC.

(1) Operate the CN–514/GRC POWER switch to ON. The POWER ON indicator will light.

(2) Operate the MANUAL-AUTOMATIC switch to MANUAL. The MANUAL indicator will light.

(3) Check the indication on the REGULATED OUTPUT VOLTAGE meter and operate the RAISE-LOWER switch to adjust the meter indication to 115 volts.

(4) Operate the MANUAL-AUTOMATIC switch to AUTOMATIC. Check to see that the MANUAL indicator extinguishes and that the meter indicates 115 volts.

(5) Operate the overvoltage protective device POWER switch (momentarily) to ON and release it. The indicator will light.

c. Receiver, Radio R–1331(P)/GRC.

(1) Connect the antenna cable to the TO ANT receptacle on the AM–1957/GRC or AM–1958A/GRC in the T–893(P)/GRC.

(2) Operate the R–1331(P)/GRC AC POWER switch to ON. The AC POWER indicator will light, the

INCOMING CALL indicator will light, and the buzzer will sound.

Note. After a few seconds, the INCOMING CALL indicator will extinguish and the buzzer will silence. Wait 5 minutes before continuing with the tuning procedure.

(3) Adjust the AM–1955A/GRC or AM–1956A/GRC OSCILLATOR control for a peak indication on the R–1331–(P)/GRC multimeter.

(4) Adjust the AM–1955A/GRC or AM–1956A/GRC WAVEMETER control for a maximum indication on the multimeter. The WAVEMETER dial should indicate within two divisions of the reading indicated on the WAVEMETER CHART for the receiver channel. If the difference is greater than two divisions, repeat the instructions given in (3) above and this subparagraph.

(5) Operate the R–1331(P)/GRC multimeter selector switch to REC SIGNAL. If a signal is being received, adjust the AM–1955A/GRC or AM–1956A/GRC REC SIG–1 control for a peak indication on the multimeter.

(6) Hold the R–1331(P)/GRC AFC DISABLE switch depressed and adjust the AM–1955A/GRC or AM–1956A/GRC OSCILLATOR control for a peak indication on the multimeter.

Note. Do not turn on the T–893(P)/GRC to perform the procedure given in (7) below.

(7) Adjust the AM–1957/GRC or AM–1958A/GRC REC SIG–2 control (in the T–893(P)/GRC) for a peak indication on the R–1331(P)/GRC multimeter.

d. Transmitter, Radio T–893(P)/GRC With AM–1957/GRC.

(1) Disconnect the antenna cable from the TO ANT receptacle and connect a CG–718B/U cable between the TO ANT receptacle and Dummy Load, Electrical DA–189/GRC on top of the equipment rack.

(2) Operate the PP–2054/GRC AC POWER switch to ON and the OPERATE-STAND BY switch to OPERAT After about 75 seconds, the FIL, L and HV indicators will light. Wa about 15 minutes before proceedin with the tuning procedure.

Note. The buzzer will sound several time during these procedures. Silence it eac time with the BUZ OFF switch.

(3) Operate the T–893(P)/GRC multi meter selector switch to MAIN TUNE.

(4) Adjust the AM–1957/GRC MAIN TUNING control for a peak indication on the multimeter. Lock the MAIN TUNING control.

Note. If the meter indication goes off-scale during the tuning procedure, depress the T–893(P)/GRC METER SHUNT switch.

(5) Operate the multimeter selector switch to MIXER and adjust the AM–1957/GRC MIXER control for a peak indication on the multimeter. Lock the MIXER control.

(6) Operate the AM–1957/GRC WAVEMETER dial to the OUT FREQ indication listed in the WAVEMETER CHART for the desired frequency.

(7) Operate the multimeter selector switch to AMP and adjust the AM–1957/GRC AMP control for a peak indication on the meter.

Note. If the LOW POWER indicator lights and the buzzer sounds, silence the buzzer with the BUZ OFF switch.

(8) Operate the multimeter selector switch to OUT FREQ and adjust the T–893–(P)/GRC AFC CORRECTION control for a peak indication on the multimeter.

(9) Check to see that the indication on the AFC meter is within ±10 divisions of midscale. If it is not, operate the T–893(P)/GRC multimeter selector switch to MAIN TUNE, recenter the AFC CORRECTION control, and repeat the procedures given in (7) and (8) above.

(10) Operate the multimeter selector switch to PWR OUT and adjust the AM–1957/GRC POWER OUT control for a peak indication on the multimeter. The POWER OUT indicator should indicate near the desired channel.

(11) Adjust the AM–1957/GRC COUPLING control for a peak indication on the multimeter, and again peak the multimeter with the AMP, POWER OUT, and COUPLING controls ((7) and (10) above).

Note. If no output is indicated, detune the COUPLING control and repeat the tuning procedure. The LOW POWER indicator should be extinguished.

(12) Operate the multimeter selector switch to REF PWR and note the indication on the multimeter.

(13) Operate the multimeter selector switch to PWR OUT. The indication on the multimeter should be several times greater than that noted in (12) above.

(14) Operate the multimeter selector switch to AFC LEV. Adjust the AFC LEVEL control for a peak indication on the multimeter.

(15) Adjust the AFC TUNE control for a peak indication on the multimeter, and again peak the AFC LEVEL ((14) above) and AFC TUNE controls.

(16) Operate the T–893(P)/GRC AFC selector switch to ODD if the desired channel number is odd, or to EVEN if the channel is even.

(17) Check the automatic frequency control (afc) circuit for lock-on by rotating the AFC CORRECTION control in either direction until the AFC meter indicates ±40. The meter indication should return to center. Return the AFC CORRECTION control to its original setting. The meter indication should again return to center and stop.

(18) Operate the multimeter selector switch to OUT FREQ.

(19) Adjust the WAVEMETER control for a maximum indication on the multimeter. The wavemeter dial should indicate within two division of the OUT FREQ reading in the WAVEMETER CHART. If the difference is greater than two divisions, repeat the entire tuning procedure.

(20) Check the indication on the DA–189/GRC meter. The meter should indicate between 15 and 30 watts.

(21) Operate the PP–2054/GRC OPERATE-STAND BY switch to STAND BY. Disconnect the CG–718B/U from the TO ANT receptacle on the AM–1957/GRC and reconnect the antenna cable to the TO ANT receptacle. Operate the PP–2054/GRC OPERATE-STAND BY switch to OPERATE.

e. Transmitter, Radio T–893(P)/GRC With AM–1958A/GRC.

(1) Disconnect the antenna cable from the AM–1958/GRC TO ANT receptacle and connect a CG–718B/U cable between the TO ANT receptacle and the DA–189/GRC on top of the equipment rack.

(2) Operate the PP–2054/GRC AC POWER switch to ON and the OPERATE-STAND BY switch to OPERATE. Wait about 15 minutes before proceeding with the tuning procedure.

(3) Operate the T–893(P)/GRC multimeter selector switch to OSC and adjust the AM–1958A/GRC OSC control for a peak indication on the multimeter.

(4) Operate the T–893(P)/GRC multimeter selector switch to MAIN TUNE and adjust the AM–1958A/GRC MAIN TUNING control for a peak indication on the multimeter. Lock the MAIN TUNING control.

Note. If the meter indication goes off-scale during the tuning procedure, depress the T–893(P)/GRC METER SHUNT switch.

(5) Operate the multimeter selector switch to MIXER and adjust the AM–1958A/GRC MIXER control for a peak indication on the multimeter. Lock the MIXER control.

(6) Operate the AM–1958A/GRC WAVEMETER dial to the OUT FREQ indication listed in the WAVEMETER CHART for the desired frequency.

(7) Operate the multimeter selector switch to AMP and adjust the AM–1958A/GRC AMP control for a peak indication on the meter.

Note. If the LOW POWER indicator lights and the buzzer sounds, silence the buzzer with the BUZ OFF switch.

(8) Operate the multimeter selector switch to AFC LEV and adjust the T–893(P)/GRC AFC CORRECTION control for a peak indication on the multimeter.

(9) Check to see that the indication on the AFC meter is within ±10 divisions of midscale. If it is not, repeat the procedure given in (4) above, recenter the AFC CORRECTION control, and then repeat the procedures given in (7) and (8) above.

(10) Operate the multimeter selector switch to PWR OUT and adjust the AM–1958A/GRC POWER OUT control for a peak indication on the multimeter. The POWER OUT indicator dial should indicate near the desired channel.

(11) Adjust the AM–1958A/GRC COUPLING control for a peak indication on the multimeter, and then repeak the multimeter with the AMP, POWER OUT, and COUPLING controls. Check to see that the T–893(P)/GRC LOW POWER indicator is extinguished.

(12) Operate the multimeter selector switch to REF PWR and note the indication on the meter.

(13) Operate the multimeter selector switch to PWR OUT. The indication on the multimeter should be several times greater than that noted in (12) above.

(14) Operate the multimeter selector switch TO AFC LEV. Adjust the AFC LEVEL control for a peak indication on the multimeter.

(15) Adjust the AFC TUNE control for peak indication on the multimeter and then repeak the AFC LEVEL and AFC TUNE controls.

(16) Operate the T–893(P)/GRC AFC selector switch to ODD if the desired channel number is odd and to EVEN if the channel is even.

(17) Check the afc circuit for lock-on by rotating the AFC CORRECTION control in either direction until the AFC meter indicates ±40. The meter indication should return to center. Return the AFC CORRECTION control to its original setting. The meter indication should again return to center and stop.

(18) Operate the multimeter selector switch to OUT FREQ.

(19) Adjust the WAVEMETER control for a peak indication on the multimeter. Check the WAVEMETER dial indication; it should be within ±2 divisions of the reading listed in the OUT FREQ column of the WAVEMETER CHART.

(20) Check the indication on the DA–189/GRC meter. The meter should indicate between 8 and 20 watts.

(21) Operate the PP–2054/GRC OPERATE-STAND BY switch to STAND BY. Disconnect the CG–718B/U from the TO ANT receptacle on the AM–1958A/GRC and reconnect the antenna cable to the TO ANT receptacle. Operate the PP–2054/GRC OPERATE-STAND BY switch to OPERATE.

3–5. Operating Pcm Components

a. TD–202/U. Operate the TD–202/U AC POWER switch to ON. Check to see that the AC POWER indicator lights.

b. TD–204/U. Operate the AC POWER switch to ON and check to see that the AC POWER indicator lights. The ALARMS NO

CABLE CURRENT indicator should light and the buzzer should sound. Operate the CABLE POWER switch to ON and silence the buzzer with the ALARMS BUZZER OFF switch.

3–6. Order-Wire Communication

Order-wire communication facilities are provided in both the AN/GRC–50A(V) components and in the TD–204/U. For communication over a radio link, use the AN/GRC–50A-(V) facilities; and for communication over a cable link, use the TD–204/U facilities. At a cable-radio conversion, use the TD–204/U facilities.

a. Initiating Call Over Radio Link.

(1) Lift Handset H–156/U from its mounting bracket.

(2) Press the R–1331(P)/GRC RING switch for about 2 seconds.

Note. If identification codes are assigned, press the RING switch in accordance with the identification code assigned to the terminal or repeater being called.

(3) Wait for an answer.

(4) Depress the H–156/U PRESS-TO-TALK switch and talk into the handset. Release the PRESS-TO-TALK switch to listen.

(5) When the call is completed, replace the H–156/U in its mounting bracket.

b. Answering Call Over Radio Link.

Note. If identification codes are assigned, answer only when the call corresponds to the assigned identification code.

(1) When the INCOMING CALL indicator lights, and the buzzer sounds, lift the H–156/U from its mounting bracket.

(2) Depress the H–156/U PRESS-TO-TALK switch and answer the call.

(3) When the call is terminated, replace the H–156/U in its mounting bracket.

c. Initiating Call Over Cable Link.

(1) Operate the TD–204/U TALK-OFF-SIG switch to TALK.

(2) Listen to the H–91A/U receiver to determine whether the order-wire circuit is in use.

(3) If the circuit is not in use, operate the TALK-OFF-SIG switch to SIG for about 2 seconds.

Note. If identification codes have been assigned, operate the TALK-OFF-SIG switch between SIG and OFF according to the code assigned to the terminal or repeater being called.

(4) Operate the TALK-OFF-SIG switch to TALK and converse with the distant operator.

(5) When the call is terminated, operate the TALK-OFF-SIG switch to OFF and replace the H–91A/U in its mounting bracket.

d. Answering Call Over Cable Link.

(1) When the TD–204/U CALL indicator lights and the buzzer sounds, operate the TALK-OFF-SIG switch to TALK and answer the call.

Note. If identification codes are assigned, answer only those calls corresponding to the codes assigned to the station.

(2) When the call is terminated, operate the TALK-OFF-SIG switch to OFF and replace the H–91A/U in its mounting bracket.

3–7. Operation Under Unusual Conditions

The AN/TRC–109(V) is fully insulated and weatherproofed for operation in hot, cold, or moderate climates. The shelter facility provides complete protection from the elements for personnel and equipment; however, under extreme conditions, the following precautions are necessary.

a. Cold Climates. Extreme cold causes cables and wires tc become hard, brittle, and difficult to handle. Be careful when handling the cables and connecting them to the assemblage so that kinks and unnecessary loops will not result in permanent damage. Make sure that binding posts and connectors in the entrance boxes are free of frost, snow, and ice. Replace the covers on receptacles, and close the entrance box covers when they are not in use. Lower the folding side panels when the entrance boxes are open. Replace the connector cover as soon as a cable is disconnected. Never drag or place an open connector in the snow.

b. Hot Climates. In hot, dry climates, connectors, receptacles, and binding posts are subject to damage from dust and dirt. Replace the

covers on the connectors and receptacles and close the covers on entrance boxes when they are not in use. Lower the folding side panels when the entrance boxes are open. Never place an open connector on the ground.

c. Warm, Damp Climates. In warm, damp climates, the equipment is subject to damage from moisture and fungi. Wipe all moisture and fungi from the equipment with a lint-free cloth.

d. Emergency Voltage Regulator Operation. If the CN–514/GRC fails to operate and no replacement is available, follow the procedures given in (1) below to operate the assemblage. If the overvoltage protective device fails to operate and no replacement is available, follow the procedures given in (2) below.

(1) *Defective CN–514/GRC.*

(*a*) Operate the POWER DISTRIBUTION PANEL EQUIP circuit breaker to OFF.

(*b*) Disconnect the cable connected to the CN–514/GRC AC POWER INPUT receptacle.

(*c*) Disconnect the cable connected to the IN receptacle on the overvoltage protective device.

(*d*) Connect the cable disconnected in (*b*) above to the IN receptacle on the overvoltage protective device.

(*e*) Operate all the POWER switches on the rack equipment to OFF and then perform the procedures given in paragraph 3–4 and 3–5.

(2) *Defective overvoltage protection device.*

(*a*) Operate the POWER DISTRIBUTION PANEL EQUIP circuit breaker to OFF.

(*b*) Disconnect the cable connected to the OUT receptacle on the overvoltage protective device.

(*c*) Disconnect the cable connected to the 5KVA LOAD MAX receptacle on the CN–514/GRC.

(*d*) Connect the cable disconnected (*b*) above to the 5KVA LOA MAX receptacle on the CN–51 GRC.

(*e*) Operate all the POWER switche on the rack equipment to OFF an then perform the procedures give paragraph 3–4 and 3–5.

3–8. Stopping Procedures

a. AN/GRC–50A(V). If the AN/GRC–50A(V) components are to be turned off for less than 2 hours, leave the R–1331(P)/GRC on and place the T–893(P)/GRC in standby by operating the PP–2054/GRC OPERATE-STAND BY switch to STAND BY. If the equipment is to be turned off for longer period, proceed as follows:

(1) Operate the R–1331(P)/GRC AC POWER switch to OFF.

(2) Operate the PP–2054/GRC OPERATE STAND BY switch to STAND BY.

(3) Operate the PP–2054/GRC AC POWER SWITCH TO OFF.

(4) Operate the T–893(P)/GRC AFC selector switch to TUNE.

b. TD–202/U and TD–204/U.

(1) Operate the TD–204/U CABLE POWER switch to OFF. The ALARMS NO CABLE CURRENT indicator will light and the buzzer will sound.

(2) Operate the TD–202/U and TD–204/U AC POWER switches to OFF.

c. Voltage Regulator CN–514/GRC. Operate the CN–514/GRC POWER switch to OFF.

d. Emergency Stopping Procedure. To turn the equipment off in an emergency, operate the POWER DISTRIBUTION PANEL MAIN circuit breaker to OFF.

Caution: **If the equipment is turned off by using the emergency stopping procedures, operate all circuit breakers and equipment power switches to OFF before attempting to restart it.**

CHAPTER 4

MAINTENANCE

Section I. PREVENTIVE MAINTENANCE

4–1. Scope of Maintenance

a. General.

(1) Operator preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to maintain the equipment in serviceable condition. Operator preventive maintenance is performed daily; specific procedures are provided in paragraph 4–2.

(2) Organizational preventive maintenance is performed monthly and quarterly; specific procedures are provided in paragraphs 4–3 and 4–4. Troubleshooting procedures are provided in paragraphs 4–5 through 4–8 for isolation and replacement of authorized repair parts (appx C).

(3) The preventive maintenance checks and services described in paragraphs 4–2, 4–3, and 4–4 outline inspections to be made at specific intervals and are designed to help maintain equipment in serviceable condition. They indicate what items should be checked and how they should be checked. Also included are procedures for authorized repairs and references to text, illustrations, and other manuals that contain supplementary information.

(4) Defective items that cannot be corrected must be reported to higher category maintenance personnel. Records and reports of repairs and preventive maintenance must be made in accordance with procedures given in TM 38–750.

b. Preventive Maintenance Checks and Services Periods. Preventive maintenance checks and services for an operating AN/TRC–109(V) are required daily (para 4–2), monthly (para 4–3), and quarterly (para 4–4). These checks and services must be performed during the specified periods. In addition, the daily checks and services must be performed under the following special conditions:

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal for any reason.

(3) At least once each week if the equipment is maintained in a standby condition.

c. Cleaning.

Warning: **Prolonged breathing of cleaning compound is dangerous; make certain that adequate ventilation is provided. Cleaning compound is flammable; *do not* use near flame. Avoid contact with the skin; wash off any that spills on your hands.**

(1) Use a dry, clean, lint-free cloth or brush to remove dust or dirt. If necessary, moisten the cloth or brush cleaning compound (FSN 7930–395–9542). After cleaning, wipe dry with a clean cloth.

Warning: **Compressed air is dangerous and can cause serious bodily harm. It can also cause mechanical damage to the equipment. Do not use compressed air to dry parts where cleaning compound has been used.**

(2) Dry compressed air, not to exceed 60 pounds per square inch, may be used to remove dirt and dust from inaccessible places.

d. Touchup Painting. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper. Brush two thin coats of paint on bare metal to protect it from further corrosion. Refer to the applicable cleaning and refinishing practices specified in TB SIG 364.

Caution: **Solar reflecting paint per MIL-E–46061 (MO) has been used to paint the exterior of some shelter facilities to lower inside temperature when the shelter is exposed to the direct rays of the sun. Before doing any touchup painting on the exterior, check for a caution notice on the inside of the entrance door. If the solar reflecting paint has been used, refer to TB SIG 354 for the proper procedures to be used in repainting touchup painting. *Do not* use any other paint on shelter facilities painted with the solar reflecting paint.**

4–2. Operator's Daily Preventive Maintenance Checks and Services

Note. If the AN/TRC–109(V) is in continuous use, perform only those sequence numbers which do not interfere with the operation of the equipment (sequence numbers 1 through 14).

Sequence No.	Item to be inspected	Procedures	References
1	External condition	Check for skin punctures, cracks, or open seams that could permit moisture to enter wall.	None.
2	Grounding system	*a.* Check grounding system to see that it is properly installed.	*a.* Para 2–3.
		b. Tighten loose ground lead connections.	*b.* None.
3	Sling assembly (if installed in truck).	Tighten turnbuckles to remove slack in sling assembly.	Fig. 2–3.
4	Entrance boxes	*a.* Clean area around receptacles.	*a.* Para 4–1*c* and figs. 1–12 and 1–13.
		b. Put covers on unused receptacles.	*b.* Fig. 1–12 and 1–13
5	EXHAUST BLOWER vent covers.	See that EXHAUST BLOWER vent covers are open and are not obstructed.	None
6	AIR FILTER cover	See that AIR FILTER cover on assemblage door is open and not clogged or obstructed.	None.
7	Power and signal cable assemblies.	*a.* Clean cable insulation and connectors (if not connected).	*a.* Para 4–1*c*.
		b. Tighten loose connections.	*b.* None.
		c. Put covers on unused cable connections.	*c* None.
8	Generator set (if used)	Perform daily preventive maintenance checks and services in applicable technical manual.	Tecvhnical manual for generator set
		INTERIOR	
9	Signal and power cables, cords, wires, and harnesses.	*a.* Tighten loose connections of plugs and connectors.	*a.* None.
		b. See that cable insulation is not cut or cracked; remove kinks and strains.	*b.* None.

equence No.	Item to be inspected	Procedures	References
10	Ceiling lights	Inspect and replace if necessary.	None.
11	Walls, ceiling, and floor.	Check for holes, open seams, or signs of seepage or leaks.	None.
12	Storage compartments	Remove unauthorized articles.	Appx B.
13	Unused components	Inspect unused components for damage, dirt, grease, moisture, or fungi accumulation. Clean as required. Check to see that covers (if available) are on unused components.	None.
		OPERATION Note. In most applications, some components will not be in use. Perform following procedures only on operating components, and only during authorized downtime.	
14	Knobs, dials, and switches.	While making operational checks sequence numbers 15 through 29), make sure that knobs, dials, and switches are free from internal and external binding.	None.
15	POWER INDICATOR neon lamp.	Apply power to assemblage by starting generator set or turning on central power source; POWER INDICATOR neon lamp lights.	Fig. 5–1.
16	POWER DISTRIBUTION PANEL circuit breakers.	*a.* Operate MAIN circuit breaker to ON; associated indicator lights, A. C. VOLTS meter indicates 115 volts ±11.5 and A.C. AMPERES meter indicates 0.	*a.* Fig. 3–1.
		b. Sequentially operate each circuit breaker to ON; associated indicator lights.	*b.* Fig. 3–1.
17	Ceiling lights	Operate LIGHT and INCAND COLD START LIGHT switches to ON; all lights glow; A. C. AMPERES meter indicates slight current drain.	Fig. 5–1.
18	Lighttightness	Close door, but leave AIR FILTER and EXHAUST BLOWER vents open; inspect for lighttightness.	None.
19	Door interlock switch	Operate BYPASS BLACKOUT switch to OFF and open door; assemblage lights extinguish.	Fig. 5–1.
20	BYPASS BLACKOUT switch	Operate to ON with door open; assemblage lights light.	Fig. 5–1.
21	Exhaust blowers	Operate BLOWER switches to ON; exhaust blowers operate.	Fig. 5–1.
22	Heater	*a.* Operate HEAT-OFF-FAN switch to HEAT, operate TEMPERATURE control and note that warm air blows from front of heater.	*a.* Fig. 5–1.

Sequence No.	Item to be inspected	Procedures	References
		b. Operate HEAT-OFF-FAN switch to FAN; fan blows air, and heating element ceases to glow.	*b.* Fig. 5–1.
		c. Operate HEAT -OFF-FAN switch to OFF.	*c.* None.
23	CN–514/GRC	Operate POWER circuit breaker to ON and adjust RAISE-LOWER control until REGULATED OUTPUT VOLTAGE meter indicates 115 volts.	Fig. 5–1.
24	Overvoltage protective device.	Operate POWER switch to ON	Fig. 5–1.
25	AN/GRC–50A(V)	Turn on and tune AN/GRC–50A (V) components to assigned frequencies.	Para 3–4*b*.
26	Pcm components	Turn on pcm components connected in operating configuration.	Para 3–5.
27	Order-wire circuits	Contaca distant terminals or repeaters on order-wire circuit and check to see that order-wire communication is clear.	Para 3–6.
28	Local communication facility.	Operate TA–312/PT to check out local communication facility.	Para 3–3.
29	Assemblage power	Operate all rack equipment AC POWER switches to OFF; associated indicators extinguish. Operate CN–514/GRC AC POWER switch to OFF; check to see that associated indicator is extinguished. Operate all circuit breakers on POWER DISTRIBUTION PANEL to OFF; associated indicators extinguish.	None.

4–3. Organizational Monthly Preventive Maintenance Checks and Services

Sequence No.	Item to be inspected	Procedures	References
1	Shelter facility skin and hardware.	Paint blistered, pitted, or flaking areas, and bare metal spots (such as steps, entrance box covers, skids, towing eyes, etc).	Para 4–1*d*.
2	Grounding system	Clean grounding rod and GROUND TERMINAL connections; tighten as required.	Para 4–1*c* and *d*.
3	Sling assembly (if installed on truck).	Clean parts, and paint bare metal spots.	Para 4–1*c* and *d*.
4	Entrance door	*a.* Clean; paint bare metal spots.	*a.* Para 4–1*c* and *d*.
		b. Tighten loose screws and bolts.	*b.* None.

Sequence No.	Item to be inspected	Procedures	References
		c. Lubricate door locks and latches with Grease, Graphite Aircraft (GGA); lubricate hinges with Lubricating Oil, General Purpose Preservative (PL-Special), or Lubricating Oil, Engine (OE–10).	*c.* None.
		d. Put gasket cement on loose gaskets.	*d.* None.
5	Air filter and vents	Clean air filter; make sure vents are clear of obstructions.	None.
6	POWER ENTRANCE BOX and VIDEO & ANTENNA ENTRANCE box.	*a.* Lubricate piano-type hinges of covers with oil (PL-Special or OE–10).	*a.* None.
		b. Paint bare metal sports	*b.* Para 4–1*d*.
7	Power and signal cables.	*a.* Repair insulation cuts and abrasions with electrical insulation tape.	*a.* None.
		b. Inspect cable layout and relocate cables as required so that they are not dangerous to, or endangered by, vehicles and personnel.	*b.* None.
		INTERIOR	
8	Signal and power cables, cords, and wires.	*a.* Tighten screws and clamps that hold wires to terminals.	*a.* None.
		b. Repair insulation cuts and abrasions with electrical insulation tape.	*b.* None.
9	Signal, power, and lighting system ducts cables.	*a.* Tighten loose screws, bolts, and clips.	*a.* None.
		b. Repair or replace defective switches, switchplates, outlets, receptacles, and jacks.	*b.* None.
10	Lighting system	*a.* Tighten loose screws and nuts on ceiling lights, and parts on POWER DISTRIBUTION PANEL.	*a.* None.
		b. Pepair or replace defective parts of lighting system and POWER DISTRIBUTION PANEL.	*b.* None.
11	Walls, ceiling, and floor.	*a.* Clean all parts	*a.* Para 4–1*c*.
		b. Check for skin punctures and cracked seams.	*b.* None.
12	Equipment mountings	*a.* Tighten loose bolts, nuts, and screws that hold equipment racks, frames, shelves, clamps, and mounting hardware. Replace missing bolts, nuts, and screws.	*a.* None.

Sequence No.	Item to be inspected	Procedures	References
		b. Check to see that equipment mountings are not bent or broken so as to endanger equipment or personnel.	*b.* Figs. 1–7 through 1–11 and fig. 5–1.
13	TA–312/PT	Check batteries and replace if necessary.	None.
14	Exhaust fans	*a.* Lubricate all points with oil (PL-Special or OE–10).	*a.* None.
		b. Clean motor and fan housing.	*b.* Para 4–1*c*.
15	Heaters	Clean heaters, and paint bare metal spots as required.	Para 4–1*c* and *d*.
16	AN/GRC–50A(V)	Perform monthly procedures as prescribed in applicable technical manual.	Appx A.
17	TD–202/U and TD–204/U	Perform monthly procedures as prescribed in applicable technical manual.	Appx A.

4–4. Organizational Quarterly Preventive Maintenance Checks and Services

Sequence No.	Item to be inspected	Procedures	References
		GENERAL	
1	Components:		
	a. Inventory	*a.* Inventory equipment; requisition missing or defective parts.	*a.* Appx B.
	b. Location of parts	*b.* Check to see that all components are mounted or stowed in assigned places, except those that are being used (power, signal, and interconnecting cables, etc).	*b.* Fig. 5–1.
	c. Publications	*c.* Requisition all operator and organizational maintenance manuals covering AN/TRC–109(V) and its components that are not on hand or in usable condition (including all current changes publications).	*c.* DA Pam 310–4; para 1–2.
2	Modification work orders	Check to see if any MWO's are required for AN/TRC–109(V) or its components. Check equipment to see if current MWO's have been applied and MWO number is stamped as required. Perform or request modifications as applicable.	Applicable MWO (see DA Pam 310–4 for MWO listing).
		EXTERIOR	
3	Shelter facility skin and hardware.	*a.* Check for skin punctures, cracks, or open seams that would permit moisture to enter wall.	*a.* None.
		b. Repair or replace defective hardware.	*b.* None.

equence No.	Item to be inspected	Procedures	References
4	Grounding system	Replace ground rod if ground lead cannot be securely tightened. Replace ground lead if it is cut, corroded, or broken.	None.
5	Entrance door	Replace defective or missing rubber gaskets or those that do not provide watertight seal. Replace broken door hinges or latches.	TB SIG 354.
6	POWER ENTRANCE BOX and VIDEO & ANTENNA ENTRANCE box.	*a.* Carefully remove dirt, sand, and moisture from around contacts of unused receptacles.	*a.* Para 4–1*c*.
		b. Tighten locknuts, screws, and bolts that hold receptacles.	*b.* None.
		c. Replace defective parts, such as gaskets, securing screws, etc.	*c.* None.
7	Power and signal cable assemblies.	Replace cable assemblies in which wiring, insulation, or connectors are defective.	None.
		INTERIOR	
8	Signal and power cables, cords, and wiring.	*a.* Dress all cables, wires, and cords neatly, using cable or cord clamps provided in assemblage, or use electrical insulation tape and twine.	*a.* None.
		b. Repair or replace defective cables, cords, wires, and harnesses.	*b.* Appx B.
9	Walls, ceiling, and floor.	Paint blistered, pitted, or flaking areas, and bare metal spots.	Para 4–1*d*.
10	Fire extinguisher	*a.* Refill if weight of contents is less than prescribed, or if seal is broken.	*a.* Appropriate personnel.
		b. Replace if valve assembly is damaged.	*b.* Appx B.
11	Chair and chair cushion	*a.* Repair or replace cushion that is torn or cut, or has split seams or exposed padding.	*a.* None.
		b. Repair or replace chair if parts are bent or broken, of if chair is unsafe for use.	*b.* None.
12	Sledge hammer and axe	Replace if handle is broken or split or not tight in head.	Fig. 5–1.
13	First aid kit	Replace if case is broken or damaged. Replace parts that have been used.	Appx B.

Section II. TROUBLESHOOTING

4–5. General Troubleshooting Procedures

Trouble symptoms are discovered through the built-in alarms in the equipment components (appx A), incorrect indications in preventive maintenance operational checks (para 4–2), from other terminals or repeaters, and the built-in test meters on the equipment components (*a* through *d* below). When a trouble indication occurs, determine the complete symptom and then refer to the troubleshooting charts in paragraph 4–6 to find the probable cause and corrective measure.

Note. When using the charts in *a* through *d* below, make careful observations because the significance of an incorrect or out-of-tolerance indication will be different from that of a zero indication.

a. Multiplexer TD–202/U.

METER SELECT switch position	Normal TEST ALIGN meter indication
TIMING IN	Green area.
PCM IN-1	Green area.
PCM IN-2	Green area (24-channel operation only).
TO RADIO XMTR	Yellow area.
FROM RADIO RCVR	Yellow area.

b. Multiplexer TD –204/U.

METER SELECT switch position	Normal TEST ALIGN meter indication
TIMING IN	Green area.
PCM IN-1	Green area.
PCM IN-2	Green area (24-channel operation only).
CABLE I	Yellow area.
CABLE V	17 plus 11.3 times number of TD–206/G's in line.

Note. If TIMING IN indication is not in green area, use 15.4 as factor for CABLE V check instead of 11.3.

c. Transmitter, Radio T–893(P)/GRC. Make the following checks with either the AM–1957/GRC or AM–1958A/GRC installed in the T–893(P)/GRC.

Multimeter selector switch position	Multimeter indication
OSC (AM–1958A/GRC only).	Greater than 10.
MAIN TUNE	Greater than 10.
MIXER	Greater than 10.
AMP	Greater than 10.
OUT FREQ	Greater than 10.
PWR OUT	Greater than 10.
AFC LEV	Greater than 10.
1 KC IN	Green area.
68 KC IN	Green area.
1 KC MOD	Green area.
PCM IN	Green area.

d. Receiver, Radio R–1331(P)/GRC. Make the following checks with the AM–1955A/GRC or AM–1956A/GRC installed in the R–1331(P)/GRC.

Multimeter selector switch position	Multimeter indication
OSC	Greater than 10.
REC SIGNAL	Greater than 10 (acceptable signal from distant transmitter required).
ORDER WIRE	Green area.
1 KC OUT	Green area.
68 KC OUT	Green area.
PCM OUT	Green area.

4–6. System Troubleshooting

The troubleshooting charts in *a* and *b* below list trouble symptoms, probable troubles, and corrective measures for each configuration of the AN/TRC–109(V). Use the chart or charts applicable to the connected configuration. The loopback checks in *c* below may be used to verify isolation of troubles in the system.

a. Radio Repeater Troubleshooting chart.

Item No.	Symptom	Possible trouble	Corrective measure
1	ALARMS TRAFFIC indicator of TD–202/U lights. No indication on TEST ALIGN meter with METER SELECT switch at FROM RADIO RCVR. AN/GRC–50A(V) operates normally and order wire is normal.	Defective pcm component at distant terminal or repeater.	Request distant terminal or repeater troubleshooting.
2	ALARMS TRAFFIC indicator of TD–202/U lights. No indication on TEST ALIGN meter with METER SELECT switch at FROM RADIO RCVR. AN/GRC–50A(V) operates normally except for noisy order wire.	*a.* Defective CG–409H/U cable between T–893(P)/GRC and TD–202/U. *b.* Defective AN/GRC–50A(V)	*a.* Check and replace if necessary. *b.* Troubleshoot AN/GRC–50A(V) (appx A).
3	ALARMS TRAFFIC indicator of TD–202/U lights. R–1331(P)/GRC SQUELCH NO SIGNAL indicator lights, buzzer sounds, and no order wire.	*a.* Defective antenna cable *b.* Defective Antenna AT–903/G *c.* Defective R–1331(P)/GRC *d.* AT–903/G not properly oriented. *e.* Defective T–993(P)/GRC at distant terminal or repeater.	*a.* Check and replace if necessary. *b.* Check and replace if necessary. *c.* Troubleshoot R–1331(P)/GRC (appx A). *d.* Check orientation. *e.* Keep R–1331(P)/GRC operating on assigned frequency. Periodically try order wire and wait for response. Send man to distant terminal or repeater.
4	Distant terminal or repeater indicates loss of pcm. No indication on TEST ALIGN meter of local TD–202/U with METER SELECT switch at TIMING IN, PCM IN–1, or TO RADIO XMTR. Other TD–202/U has no alarms.	*a.* Defective CG–1040B/U cable between TD–202/U's. Note. In 24-channel operation, if TEST ALIGN meter of TD–202/U indicates loss of either PCM IN-1 or PCM IN-2, check associated CG–1040B/U cable. *b.* Defective TD–202/U (no output to T–893(P)/GRC). *c.* Other TD–202/U defective (no pcm or timing out).	*a.* Check and replace if necessary. *b.* Troubleshoot TD–202/U (appx A). *c.* Troubleshoot TD–202/U (appx A).
5	No order-wire communication available in one radio link, all other indications are normal.	*a.* Defective CX–7872/TCC between associated TD–202/U and R–1331(P)/GRC. *b.* Defective associated TD–202/U. *c.* Defective associated R–1331(P)/GRC.	*a.* Check and replace if necessary. *b.* Troubleshoot TD–202/U (appx A). *c.* Troubleshoot R–1331(P)/GRC (appx A).

Item No.	Symptom	Possible trouble	Corrective measure
6	Distant terminal reports high noise level. All other indications are normal.	Defective TD-202/U	Troubleshoot TD-202/U (appx A).
7	Order wire garbled and noisy. All other indications are normal.	*a.* Defective TD-202/U *b.* Defective AN/GRC-50A(V) *c.* Defective CX-7872/TCC between associated TD-202/U and R-1331(P)/GRC.	*a.* Troubleshoot TD-202/U (appx A). *b.* Troubleshoot AN/GRC-50A((appx A). *c.* Check and replace if necessar
8	Incorrect indication on TEST ALIGN meter of TD-202/U with METER SELECT switch at TO RADIO XMTR.	*a.* Video level adjustment required on TD-202/U. *b.* Defective TD-202/U	*a.* Adjust OL control on panel 5A2 of TD-202/U (para 2- *b.* Troubleshoot TD-202/U (appx A).
9	Incorrect indication on TEST ALIGN meter of TD-202/U with METER SELECT switch at FROM RADIO VMTR. Order wire noisy.	*a.* Video level adjustment required on TD-202/U. *b.* Defective TD-202/U	*a.* Adjust RL control on panel 5A3 of TD-202/U (para 2-9) *b.* Troubleshoot TD-202/U (appx A).

b. Cable Repeater Troubleshooting Chart.

Item No.	Symptom	Possible trouble	Corrective measure
1	ALARMS TRAFFIC indicator on TD-204/U lights, buzzer sounds, and order wire is normal.	*a.* Defective TD-206/G in cable link. *b.* Defective TD-204/U *c.* Defective pcm component at distant terminal or repeater.	*a.* Troubleshoot cable link (para 4-7). *b.* Trubleshoot TD-204/U (appx A). *c.* Request distant terminal or repeater troubleshooting.
2	Distant terminal or repeater indicates loss of pcm. No indication on TEST ALIGN meter of local TD-204/U with METER SELECT switch at TIMING IN. Other TD-204/U has no alarms.	*a.* Defective CG-1040B/U cable between TD-204/U's. Note. In 24 channel operation, if TEST ALIGN meter of TD-204/U indicates loss of either PCM IN-1 or PCM IN 2, check associated CG-1040B/U cable. *b.* Other TD-204/U defective (no timing out).	*a.* Check and replace if necessary. *b.* Troubleshoot TD-204/U (appx A).
3	Distant terminal indicates out of frame pcm. No indication on TEST ALIGN meter of local TD-204/U with METER SELECT switch at PCM IN-1. Other TD-204/U has no alarms.	*a.* Defective CG-1040B/U cable between TD-204/U's. *b.* Other TD-204/U defective (no pcm out).	*a.* Check and replace if necessary. *b.* Troubleshoot TD-204/U (para 4-7).

Item No.	Symptom	Possible trouble	Corrective measure
4	ALARMS TRAFFIC indicator of TD–204/U lights, buzzer sounds, and no order wire.	*a.* Defective TD–206/G in cable link. *b.* Defective transmission cable in cable link. *c.* Defective TD–204/U *d.* Defective TD–204/U at distant terminal or repeater.	*a.* Troubleshoot cable link (para 4–7). *b.* Troubleshoot cable link (para 4–7). *c.* Troubleshoot (TD–204/U (appx A). *d.* Keep TD–204/U operating. Periodically try order wire and wait response. Send man to distant terminal or repeater.
5	ALARMS TRAFFIC indicator of TD–204/U and ALARMS NO CABLE CURRENT indicator light and buzzer sounds. No order wire available.	Open transmission cable (both directions) in cable link.	Troubleshoot cable link (para 4–7).
6	ALARMS NO CABLE CURRENT indicator on TD–204/U lights and buzzer sounds. Order wire is normal.	*a.* Momentary overcurrent or undercurrent in cable link. *b.* Defective TD–204/U	*a.* Operate CABLE POWER switch to OFF and then to ON. *b.* Troubleshoot TD–204/U (appx A).
7	ALARMS NO CABLE CURRENT indicator on TD–204/U lights. No order-wire transmission.	Open transmission cable (send side) in cable link.	Troubleshoot cable link (para 4–7).
8	Distant terminal or repeater indicates loss of pcm. All local indication are normal.	Defective TD–206/G in cable link.	Troubleshoot cable link (para 4–7).
9	Switchboard operator at distant terminal reports high noise level, but all local indications are normal.	Defective TD–204/U	Troubleshoot TD–204/U (appx A).
10	Order wire garbled and noisy; all other indication normal.	Defective TD–204/U	Troubleshoot TD–204/U (appx A).
11	Through order-wire communications not available, but all other indications are normal.	Defective CX–7872/TCC cable between TD–204/U's.	Check and replace if necessary.
12	Order wire not available; all other indications normal.	*a.* Defective associated TD–204/U. *b.* Defective distant TD–204/U	*a.* Troubleshoot TD–204/U (appx A). *b.* Request distant terminal or repeater troubleshooting.
13	Distant terminal indicates out of frame pcm; all local indication are normal.	*a.* Defective TD–206/G in cable link. *b.* Defective TD–204/U	*a.* Troubleshoot cable link (para 4–7). *b.* Troubleshoot TD–204/U (appx A).
14	Incorrect indication on TEST ALIGN meter of TD–204/U with METER SELECT switch at SERV FAC and SERV SEL switch at RCC.	Cable current adjustment required at distant terminal or repeater.	Request cable current adjustment at distant terminal or repeater.

Item No.	Symptom	Possible trouble	Corrective measure
15	Distant terminal or repeater request cable current adjustment. TEST ALIGN meter of local TD-204/U does not indicate in yellow area with METER SELECT switch at CABLE I.	Cable current adjustment required.	Adjust CABLE CURRENT AD control for center hairline indication in yellow area of TEST ALIGN meter.
16	TEST ALIGN meter does not give correct indication with METER SELECT switch at CABLE V.	Shorted transmission cable in cable link.	Troubleshoot cable link (para 4-7).

c. Loopback Checks. Output circuits of the pcm components may be looped back to the input circuits to verify isolation of troubles in a system. The loopback checks must be coordinated with the distant terminal or repeater whenever possible. Determine which side of the component to check, perform the special conditions, and connect the cables as required Check the component by operating the METER SELECT switch through its positions (para 4-5) and observing the various indications When the loopback checks are complete, re connect the cables for the system requirements

Component	System side	Special conditions	Connection	
			From	To
TD-202/U	Pcm	None	PCM OUT-1 PCM OUT-2 TIM OUT-1	PCM IN-1 PCM IN-2 TIM IN
	Radio	OPR-TEST switch at TEST	FROM RADIO RCVR	TEST OUT
TD-204/U	Pcm	None	PCM OUT-1 PCM OUT-2 TIM OUT-1	PCM IN-1 PCM IN-2 TIM IN
	Cable	MILE switches at 1/2 CABLE POWER switch at OFF SYSTEM video connectors connected together instead of to transmission cable.	TO CABLE	FROM CABLE

4-7. Cable Link Troubleshooting

a. Order Wire Available With No Pcm or Shorted Transmission Cable.

(1) Disconnect the CG-1040B/U cable from the TD-204/U PCM IN-1 connector.

(2) Operate the TD-204/U METER SELECT switch to SERV FAC.

(3) Loosen the TD-204/U front panel screws, press the PUSH TO RELEASE CHASSIS button, and pull front panel forward.

(4) Operate the TD-204/U SERV SEL switch to R.

(5) Operate the TD-204/U NORM OPR-ZERO SET-READ switch to ZERO SET.

(6) Adjust the ZERO SET control for a center hairline indication on the TEST ALIGN meter.

(7) Operate the TD–204/U NORM OPR-ZERO SET-READ switch to READ.

(8) Operate the TD–204/U SYSTEM FAULT LOCATOR MILES switches for a center hairline indication on the TEST ALIGN meter (as close as possible).

(9) From the positions of the SYSTEM FAULT LOCATOR MILES switches, determine the number of good TD–206/G's between the TD–204/U and the defective cable section or TD–206/G.

(10) Operate the TD–204/U SYSTEM FAULT LOCATOR MILES switches to 0 and the NORM OPR-ZERO SET-READ switch to NORM OPR.

(11) Slide the TD–204/U front panel back until it locks into place and tighten the front panel screws.

(12) Operate the TD–204/U CABLE POWER switch at each end of the cable link to OFF.

(13) Send a lineman out to troubleshoot with Test Set, Telephone AN/PTM–7.

Warning: **Do not operate the TD–204/U CABLE POWER switch at either end of the cable link unless requested by the lineman. If the CABLE POWER switch is at ON, voltages as high as 1,100 volts may be present in the transmission cable.**

(14) Coordinate with the lineman to troubleshoot and make the necessary replacement (cable section or TD–206/G).

. *Order Wire Available With Pcm Out of me or Noise on All Channels.*

(1) Operate the TD–204/U CABLE POWER switch at each end of the link to OFF.

(2) Send a lineman out to the TD–206/G at the midpoint in the cable link with the AN/PTM–7 and instruct him to connect into the cable link.

(3) When order wire is established with the lineman, instruct him to perform the loopback check with the AN/PTM–7.

Warning: **Do not operate the TD–204/U CABLE POWER switch to ON at either end of the cable link unless requested by the lineman. If the CABLE POWER switch is operated to ON, voltages as high as 1,100 volts may be present in the transmission cable.**

(4) Operate the CABLE POWER switch to ON at both ends of the cable link and check to see which end of the cable link has an ALARMS FRAME indicator lighted on the terminal equipment (TD–352/U), or noise on all channels.

(5) When the indications are obtained, operate the TD–204/U CABLE POWER switch at each end of the link to OFF.

(6) Instruct the lineman to substitute another TD–206/G in the cable link. When the substitution is complete, operate the CABLE POWER switches to ON and check to see if the trouble still exists.

(7) If the trouble is not corrected, instruct the lineman to replace the original TD–206/G in the cable link and proceed to a TD–206/G halfway between his position and the end of the cable link that reported a frame alarm or noise on all channels during the first loopback check ((4) above).

(8) Perform the procedures given in (3) through (6) above at the next TD–206/G. If the trouble is not corrected, instruct the lineman to replace the original TD–206/G and continue the troubleshooting procedures until the defective TD–206/G is located.

c. No Order Wire or Pcm Available. When the TD–204/U ALARMS NO CABLE CURRENT indicator immediately lights after the CABLE POWER switch is operated to OFF and then to ON, the transmission cable is open. Perform the following procedures to locate the defective cable section.

Note. If the TD–204/U ALARMS NO CABLE CURRENT indicator remains extinguished after the CABLE POWER switch is operated to OFF and then to ON, the transmission cable is shorted. Perform the procedures given in *a* above to locate the defective cable section.

(1) Operate the TD–204/U CABLE POWER switch to OFF.
(2) Disconnect the cable from the TD–204/U TO CABLE connector and connect it to Test Set TS–27B/TSM.
(3) Measure the capacitance of the cable with the TS–27B/TSM and translate the indication into the distance to the fault (fig. 4–1).
(4) If the indicated distance exceeds 10 miles, send a lineman out to the 10-mile point to repeat the measurement.
(5) Instruct the lineman to use the AN/PTM–7 at the cable connection nearest the fault to locate the distance to the fault.

Note. When the fault is located in a tion of the cable link where two cable tions join, use the AN/PTM–7 order-facility to determine which cable se is at fault.

(6) When the fault is located, replace cable section.

4–8. Assemblage Troubleshooting

a. General. Replacement and repair of co ponents and parts for the AN/TRC–109(are authorized for the various levels of maint nance personnel as indicated in section II the maintenance allocation chart (appx C The tools and test equipment required a listed in section III of the maintenance alloc tion chart. The troubleshooting information i the troubleshooting chart (*b* below) is base on symptoms that would be obtained whil performing the operator's daily preventive maintenance checks and services (para 4–2) and

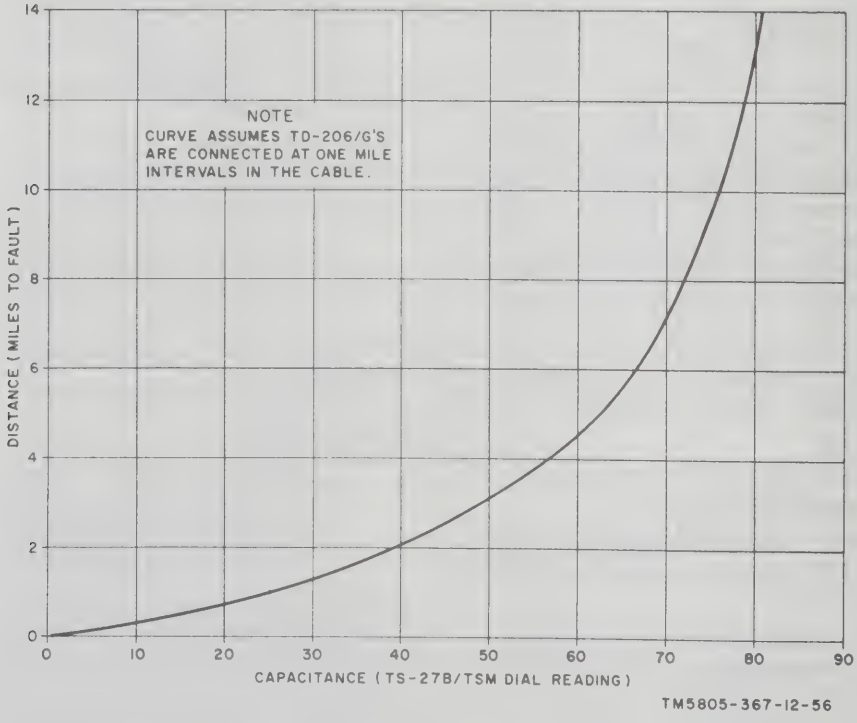


Figure 4–1. Test Set TS–27B/TSM, CX–4245/G transmission cable capacitance-distance curve.

ganizational monthly preventive maintenance ecks and services (para 4–3). When an abrmal symptom is obtained, locate the mptom in the troubleshooting chart and perrm the corrective measure indicated, as authorized in the maintenance allocation chart. If the corrective measure does not correct the trouble, replace the component and refer the defective component to higher category maintenance.

b. Troubleshooting.

Item No.	Symptom	Possible trouble	Corrective measure
1	POWER INDICATOR neon light fails to glow when power is applied assemblage.	*a.* Defective lamp *b.* Defective power cable *c.* Defective POWER 115V AC IN receptacle. Note. If immediate operation is required, and POWER 115V AC OUT receptacle is not used to power another assemblage, use POWER 115V AC OUT receptacle for input power.	*a.* Replace lamp. *b.* Check and repair or replace as required. *c.* Replace receptacle.
2	A.C. VOLTS meter indicates 0 volt when power is applied to assemblage and MAIN circuit breaker is operated to ON.	*a.* Defective MAIN circuit breaker. *b.* Defective A.C. VOLTS meter.	*a.* Replace circuit breaker. *b.* Replace meter.
3	Glowlamp fails to glow when associated circuit breaker is operated to ON.	*a.* Defective glowlamp *b.* Defective circuit breaker	*a.* Replace glowlamp. *b.* Replace circuit breaker.
4	Fluorescent ceiling lamps do not operate when LIGHT switch is operated to ON. Incandescent ceiling lamps operate normally.	Defective LIGHT switch	Replace switch.
5	Incandescent ceiling lamps do not operate when INCAND COLD START LIGHT switch is operated to ON. Flourescent ceiling lamps operate normally.	Defective INCAND COLD START LIGHT switch	Replace switch.
6	Flourescent and incandescent ceiling lamps do not operate.	*a.* Defective BYPASS BLACK-OUT switch. *b.* Defective LIGHTS circuit breaker on POWER DISTRIBUTION PANEL.	*a.* Replace switch. *b.* Replace circuit breaker.
7	No indication on A.C. AMPERES meter with ceiling lamps operating.	Defective A.C. AMPERES meter.	Replace meter.
8	Ceiling lights are not extinguished when door is opened and BYPASS BLACKOUT switch is at OFF.	*a.* Defective door microswitch *b.* Defective BYPASS BLACK-OUT switch.	*a.* Replace switch. *b.* Replace switch.

Item No.	Symptom	Possible trouble	Corrective measure
9	Exhaust blower fails to operate when BLOWER switch is operated to ON.	*a.* Defective exhaust blower	*a.* Check and repair or repla as required.
		b. Defective BLOWER switch or receptacle.	*b.* Check and replace as requi d.
		c. Defective blower motor	*c.* Check and replace as requir .
10	Both exhaust blowers fail to operate when BLOWER switches are operated to ON.	*a.* Defective BLOWERS circuit breaker on POWER DISTRIBUTION PANEL.	*a.* Check and replace as requir .
		b. Defective ac wiring	*b.* Check and replace as requir
11	Heater fails to operate properly.	*a.* Defective HEATER receptacle.	*a.* Check and replace as require
		b. Defective heater	*b.* Check and replace as require
		c. Defective HEATER circuit breaker.	*c.* Check and replace as require
		d. Defective ac wiring	*d.* Check and repair as required.
12	CN–514/GRC POWER indicator does not light when POWER circuit breaker is operated to ON.	*a.* Defective power cable to CN–514/GRC.	*a.* Check and repair or replace a required.
		b. Defective EQUIP circuit on POWER DISTRIBUTION PANEL.	*b.* Replace circuit breaker.
		c. Defective CN–514/GRC	*c.* Check and repair or replace as required.
13	No ac power available from any CONVENIENCE receptacle.	Defective CONV circuit breaker on POWER DISTRIBUTION PANEL.	Replace circuit breaker.
14	Power indicator on overvoltage protective device does not light when POWER switch is operated to ON.	*a.* Defective power cable between CN–514/GRC and overvoltage protective device.	*a.* Check and repair or replace as required.
		b. Defective overvoltage protective device.	*b.* Check and repair or replace as required.
		c. Defective CN–514/GRC	*c.* Check and repair or replace as required.
15	No rack equipment operates with CN–514/GRC and overvoltage protective device operating.	*a.* Defective overvoltage protective device.	*a.* Check and repair or replace as required.
		b. Defective ac wiring	*b.* Check and repair or replace as required.
16	Local communications not available with TA–312/PT.	*a.* Defective TA–312/PT	*a.* Check and repair or replace as required.
		b. Defective wiring	*b.* Check and repair or replace as required.

Section III. ORGANIZATIONAL REPAIR PROCEDURES

4–9. Component Removal and Replacement

a. Removal.

(1) Operate the component AC POWER switch to OFF.

(2) Disconnect the component power cord from the associated power receptacle.

(3) Note, and disconnect all cables, cords, and leads from the component.

(4) Loosen and remove the screws that secure the component to the equipment rack.

(5) Slide the component forward, out of the rack, and place it on the floor of the assemblage.

(6) If the component is to be replaced with another component, remove the

screws that secure the mounting brackets to the sides of the component, and remove the brackets.

(7) If the component is to be shipped or taken to another location, replace the cover and case associated with it.

b. Replacement.

(1) Mount the brackets removed from the original component (*a*(6) above to the replacement component.

(2) Slide the replacement component into position in the rack.

(3) Fasten the mounting brackets on the component to the equipment rack with the screws removed in *a*(4) above.

(4) If the replacement component is supplied with a cover, remove it.

(5) Connect the cables, cords, and leads removed from the original component to the replacement component.

(6) Turn on the component in accordance with the applicable procedures in chapter 3 and perform the applicable daily preventive maintenance procedures given in paragraph 4–2 and the component technical manual.

4–10. Electric Heater Repairs

a. Remove the heater from its mounting base and remove the cover plates to provide access to the interior of the heater.

b. Refer to the heater instruction plates for circuit details and identification of heater parts. Replace defective parts as authorized.

4–11. Exhaust Blower Repairs (fig. 4–2)

Organizational repair of blowers is restricted to replacement of ac power cords and the blower motor and impeller.

a. Operate the appropriate BLOWER switch to OFF.

b. Remove the defective power cord, blower motor, or impeller.

c. Refer to figure 4–2 to determine the correct connections for the required motor rotation and the required position of the impeller. Be sure that the concave portion of the impeller faces the airflow holes as indicated.

Note. If the replacement motor is provided with two mounting sides, install the motor so the capacitor side is facing the front wall.

4–12. POWER DISTRIBUTION PANEL Repairs (fig. 4–3)

***Warning:* Before performing any POWER DISTRIBUTION PANEL repairs, disconnect the power cable from the POWER 115V AC IN receptacle in the POWER ENTRANCE BOX.**

a. Preliminary Procedures. Remove the screws that secure the cover to the POWER DISTRIBUTION PANEL and remove the the cover.

b. Removal and Replacement of Circuit Breaker.

(1) Grasp the defective circuit breaker and pull it straight out from the panel.

(2) Disconnect the wires connected to the circuit breaker.

(3) Connect the wires to the appropriate terminals of the replacement circuit breaker.

(4) Position the circuit breaker in the POWER DISTRIBUTION PANEL and firmly press it in place.

c. Removal and Replacement of Current Transformer.

(1) Note and disconnect the black and white leads from the transformer terminals.

(2) Remove the nuts and washers that secure the current transformer inside the panel, and remove the current transformer.

Note. Count the number of turns of heavy black wire through the center hole of the current transformer before proceeding to the next step.

(3) Disconnect the blace wire wound around the current transformer from the MAIN circuit breaker and carefully unwind the wire.

***Caution:* Be sure that the number of turns around the replacement current transformer is the same as that on the original transformer.**

(4) Wind the black wire around the replacement current transformer.

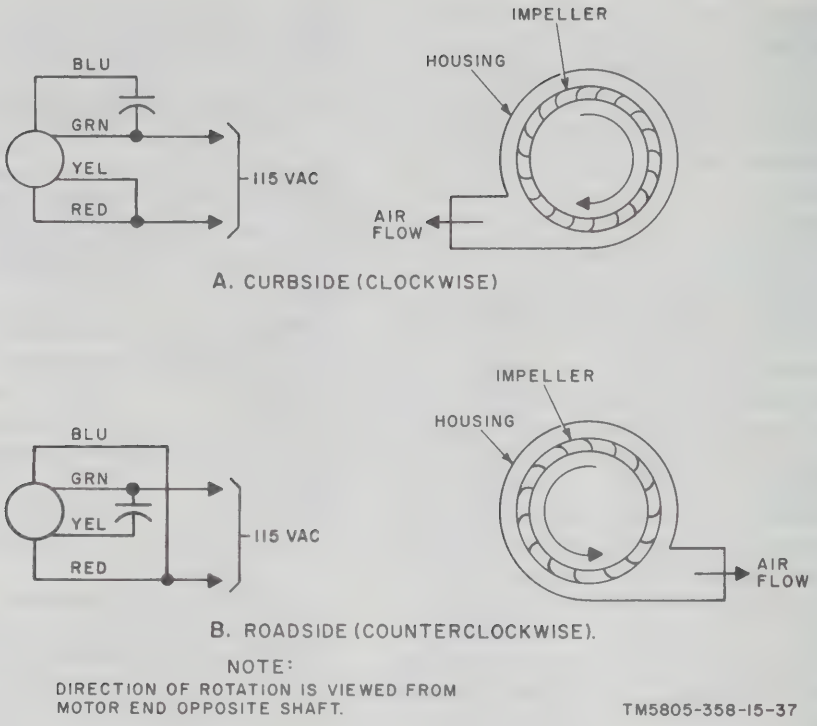


Figure 4–2. Blower motor connections and impeller installation diagram.

(5) Reconnect the black wire to the MAIN circuit breaker.
(6) Position the current transformer inside the panel and secure it with the original nuts and washer.
(7) Connect the black and white ammeter leads to the appropriate terminals of the transformer.

d. Removal and Replacement of Meters.
(1) Note the color connections and remove the leads from the meter terminals.
(2) Remove the bolts that secure the meter to the panel and lift the meter out.
(3) Position the replacement meter in the panel and secure it with the original bolts.
(4) Connect the leads to the appropriate terminals of the replacement meter.

4–13. Removal and Replacement of Power Cable and Entrance Box Connectors

a. Power Receptacles.
(1) Disconnect the power cable from the POWER 115 AC IN receptacle in the POWER ENTRANCE BOX.
(2) Remove the interior cover of the POWER ENTRANCE BOX, disconnect the wires from the appropriate receptacle, and remove the receptacle.
(3) Install the replacement receptacle, connect the wires to the proper terminals of the receptacle, and replace the cover on the POWER ENTRANCE BOX.

b. Antenna and Video Cable Receptacles.
(1) Remove the interior cover for the Video & ANTENNA ENTRANCE box, disconnect the receptacle to be replaced and remove the receptacle.
(2) Install the replacement receptacle and connect it. Replace the interior cover on the VIDEO & ANTENNA ENTRANCE box.

c. Power Cable Connectors. Refer to figures 4–4 and 4–5 for details of removal and replacement procedures.

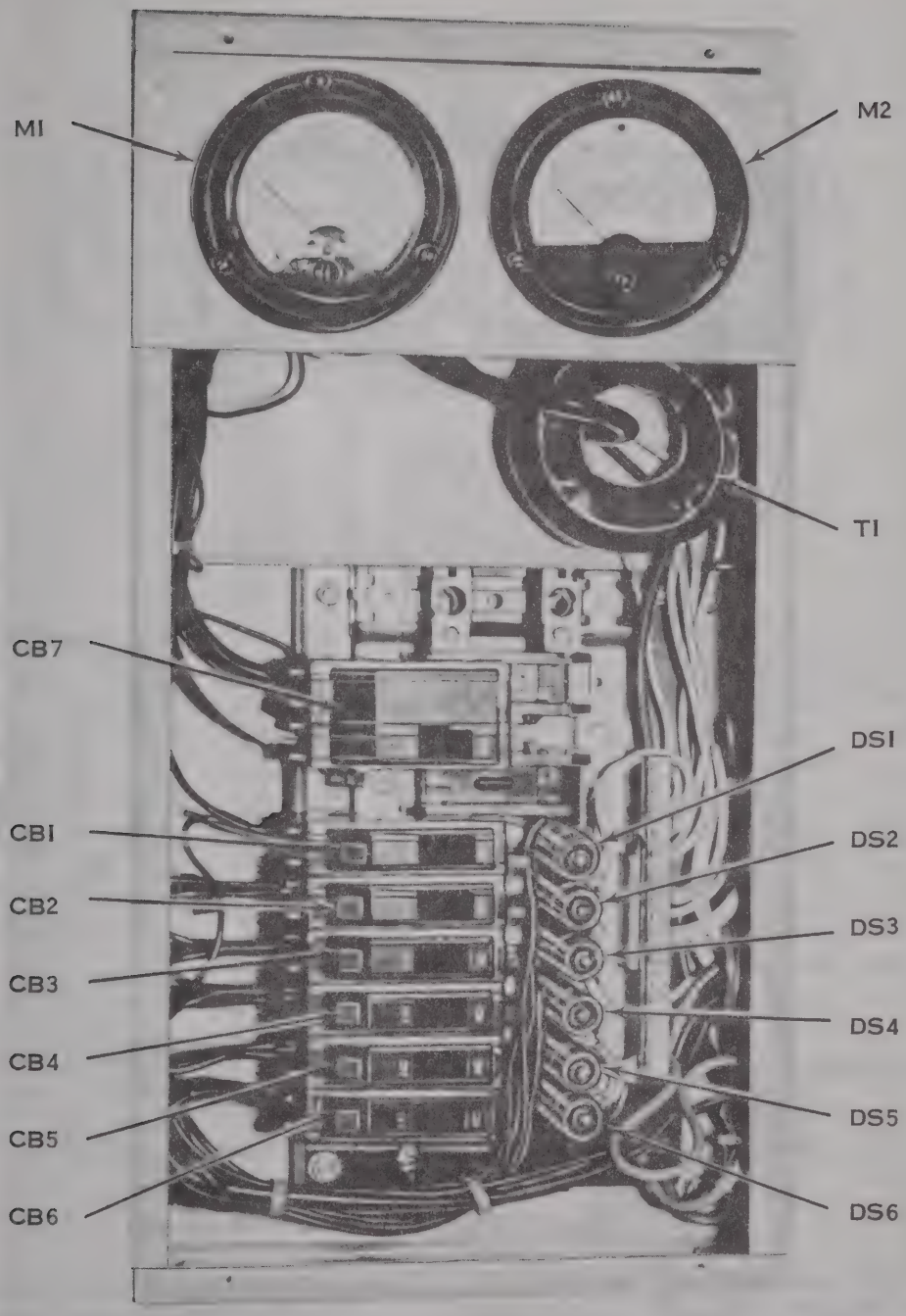


Figure 4-3. POWER DISTRIBUTION PANEL, interior details.

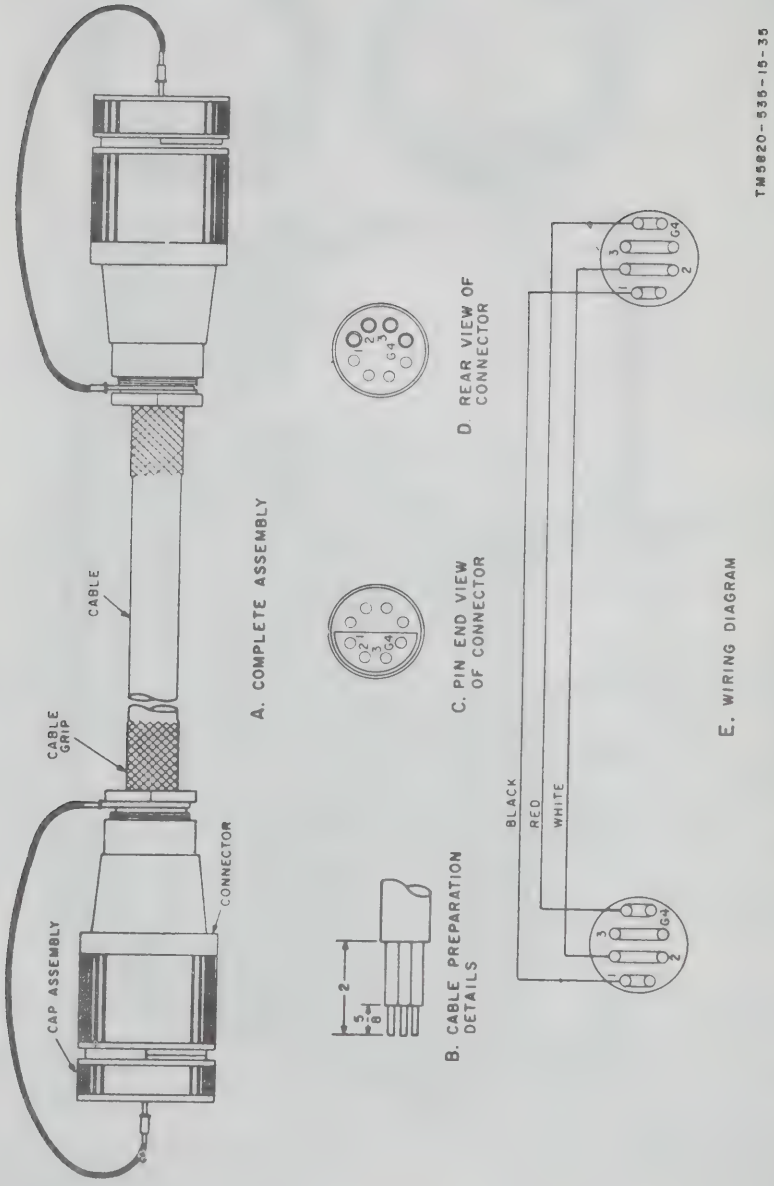


Figure 4-4. Power cable repair details.

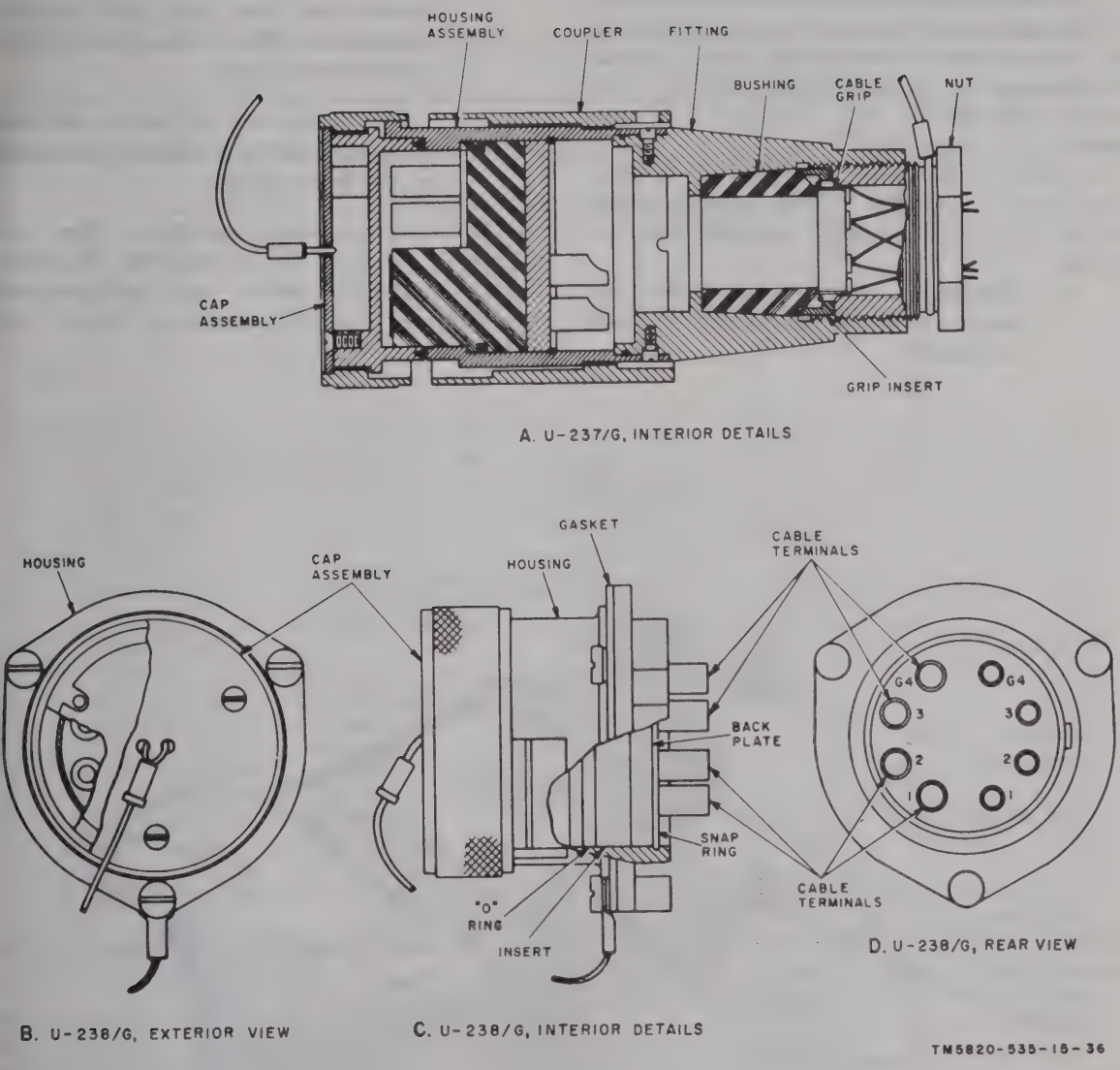


Figure 4–5. Power cable connector and power receptacle assembly details.

Section IV. DS, GS, AND DEPOT MAINTENANCE

4–14. Scope of Direct Support and General General Support Maintenance

a. General. Direct and general support maintenance consists entirely of corrective maintenance procedures as indicated in the maintenance allocation chart (appx C).

b. Tools and Test Equipment Required. The tools and test equipment required for direct support and general support maintenance of the AN/TRC–109(V) are listed in section III of the maintenance allocation chart (appx C).

4–15. Direct Support Repair Procedures

a. Communications Equipment Repair. Refer to the applicable technical manual (appx A) for instructions in performing direct support maintenance on the AN/GRC–50A(V), TD–202/U, TD–204/U, and TA–312/PT components.

b. Shelter, Electrical Equipment S–297/TRC–209(V) Repairs. Direct support repair of the S–297/TRC–109(V) includes the following:

(1) Emergency repairs of holes and minor structural damage to the shelter facility.

(2) Removal and replacement of the do handles and latchbolt assemblies, e trance door filter, and cover assen blies and gaskets for the blower ven and entrance boxes.

Note. Refer to TB SIG 354 for additiona information on direct support maintenanc of the shelter facility.

c. Overvoltage Protective Device (figs. 4–6 and 4–7). Remove the cover from the over-voltage protective device, and then perform the required troubleshooting and repair procedures.

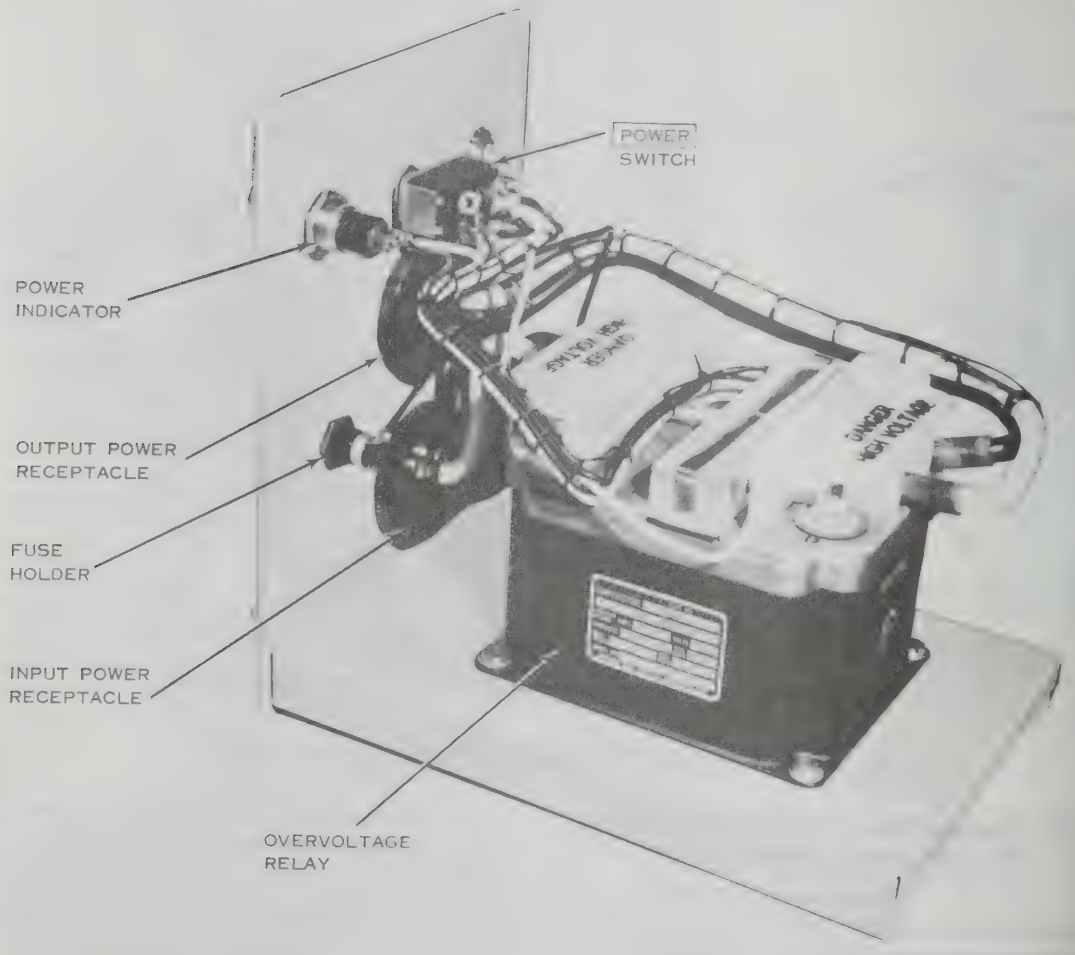


Figure 4–6. Overvoltage protective device, parts location.

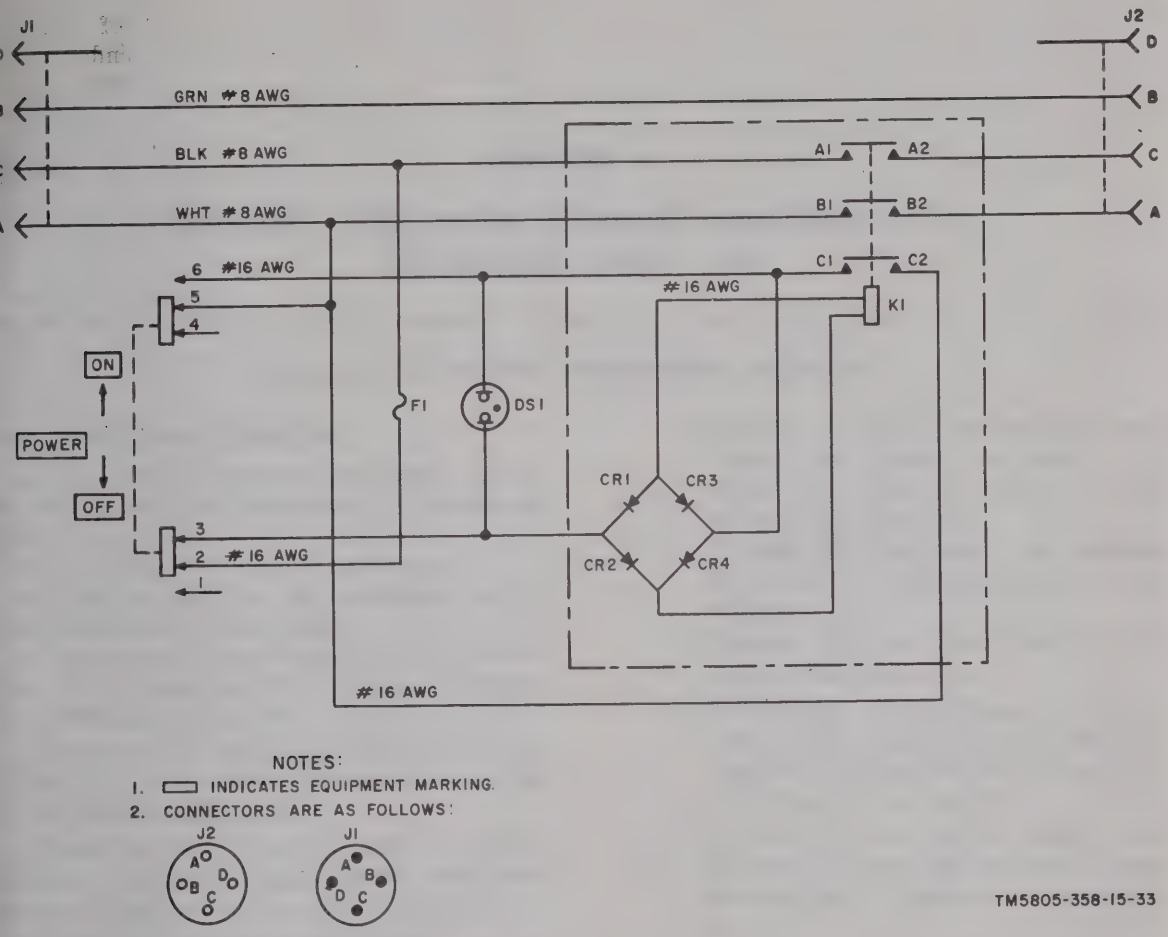


Figure 4-7. Overvoltage protective device, schematic-wiring diagram.

4-16. General Support Repair Procedures

a. Communication Equipment Repair. Refer to the applicable technical manual (appx A) for instructions on performing general support maintenance on the communications equipment in the assemblage.

b. Shelter, Electrical Equipment S-297/TRC-109(V) Repair. General support maintenance of the S-297/TRC-109(V) includes replacement of doors and skids, and permanent repair of holes and major structural damage to the shelter. Refer to TB SIG 354 for further information on general support maintenance of the shelter facility.

4-17. Depot Maintenance

Depot maintenance of the AN/TRC-109(V) includes major repair and overhaul of the equipment components and the shelter facility. Refer to the applicable technical manual for the individual equipment components for depot overhaul standards and procedures.

CHAPTER 5

SHIPMENT AND LIMITED STORAGE AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

5–1. Preliminary Procedures

a. Turn off all operating equipment according to the stopping procedures in paragraph 3–8.

b. Turn off the blowers and heater.

c. Check to see that all equipment components are secure in their racks.

d. Remove the mounting straps and fixtures from the storage cabinets for use in securing the assemblage equipment.

e. Remove the batteries from the TA–312/PT and the hand lantern for prolonged storage or long distance shipment.

f. Secure all items in their racks or storage positions with the clamps provided, and mount the wastebasket in its bracket (fig. 5–1).

g. Place all miscellaneous items in the storage cabinets.

h. Close and secure the EXHAUST BLOWER vents and the AIR FILTER vent on the entrance door.

5–2. Disassembly of Antenna System

a. Removing Mast Sections From Mast AB–577/GRC.

(1) Unlock the snubber clamps on the upper and middle guys, and release the tension on the guys.

(2) Rotate the snubber adjustment to the closed position.

(3) Release the handbrake, and raise the mast sections to the upper limit. Lock the handbrake.

(4) Release the six catches on the launcher, and remove the mast section carrier. Place the carrier in a convenient place close to the mast.

(5) Install the spanner wrench in the launcher as a foot lever.

(6) Release the handbrake, and operate the winch to lower the bottom mast section.

(7) Depress the foot lever (step on it), and lock the handbrake.

(8) Release the clamp-opening tool (secured to the angle bracket under the top plate of the launcher frame) by removing the locking pin.

(9) Unlock the mast section clamp with the tool. Operate the winch to lower the elevator to the base of the launcher.

(10) Remove the bottom mast section, and place it in the mast section carrier. Remove the mast section clamp and place it in Bag Assembly BG–106A.

(11) Disconnect the CG–1859/U from the receptacle in the ANTENNA & VIDEO ENTRANCE box. Remove the UG–1374/U from the CG–1859/U and store it in the pouch on Reel, Cable RC–436/GRC.

(12) Operate the winch to raise the elevator platform to the bottom of the next mast section.

(13) Repeat the procedures given in (6), (7), (9), (10), and (12) above for the next two mast sections.

(14) Lower the next mast section about halfway, and lock the handbrake.

(15) Climb up the back of the launcher, and remove the middle guys from the middle guy ring. Remove the guy ring. Store the guy ring and the middle guys in the BG–102A.

(16) Repeat the procedures given in (6), (7), (9), (10), and (12), above until all but the top mast section are removed.

(17) Lower the last mast section until the top of the mast is about 12 inches from the top of the launcher frame. Lock the handbrake.

b. Lowering Launcher.

(1) Climb up the back of the launcher and release the cables from the AT–903/G's. Finish coiling the cables on the RC–436/GRC (use cable winding mechanism on PU–626/G trailer tailgate), and place the UG–1374/U in the pouch.

(2) Remove the three top guys from the top guy ring.

(3) Remove the spanner wrench from the launcher base.

(4) Unlock the snubber clamps on the launcher guys, and release the tension on the guys. Remove the guy on the open side of the launcher.

(5) Remove the GP–2 stakes from the launcher base by rocking the launcher to loosen them and pulling them straight out.

(6) Move the mast section carrier to a position behind the launcher so that the launcher will lie on the carrier when it is lowered.

(7) Insert two GP–2 stakes in the base of the launcher to act as a hinge, and drive two GP–2 stakes into the ground next to them to prevent the launcher from slipping while it is being lowered.

(8) Lower the launcher until it is resting on the mast section carrier and remove the guys from the launcher. If the AB–957/GRC is used, remove the guys from the ends of the AB–957/GRC and from the free-moving AT–903/G.

c. Removing AT–903/G's and AB–57 GRC.

(1) If the AB–957/GRC is used, rem ve both AT–903/G's from the ante na mounts, remove the AB–957/G C from the antenna adapter, and rem ve the adapter from the top mast secti n.

(2) Release the handbrake and rem e last mast section through the top f of the launcher. Store the mast s - tion in the mast section carrier.

(3) Operate the winch to raise the elev tor platform to the upper limit. In sert the locking pin in the rear c the elevator platform. Secure the han brake.

(4) Position the clamp-opening tool ove the angle bracket under the top plate of the launcher and insert the pin in place to secure the tool in position.

d. Disassembly of Launcher.

(1) Remove the GP–2 hinge stakes at the base of the launcher.

(2) Remove the winch from the launcher frame and secure it in the accessory bag.

(3) Lift the launcher off the mast section carrier and place it on the ground.

(4) Place the mast section carrier in the launcher and lock the six catches.

e. Removal of Guys and Stakes.

(1) Release all of the guys from the stakes. Coil the guys and store them in the BG–106A.

(2) Remove the stakes from the ground and clean them.

(3) Store the GP–2 and GP–112/G stakes in the BG–106A.

(4) Store the GP–113/G stakes in the brackets in the PU–626/G.

f. Stowing Antenna Equipment on PU–626/G Trailer (figs. 1–3 and 1–4).

Warning: **The AB–577/GRC weighs over 200 pounds and is cumbersome to handle. At least two men should handle the AB–577/GRC together to avoid injury.**

(1) Lift the AB–577/GRC onto the shelf on the roadside of the PU–626/G

trailer and move the AB–577/GRC forward on the shelf. Secure the back of the AB–577/GRC to the shelf with the screw provided.

(2) Check the area to make sure that all parts that are to be stored in the BG–106A have been placed it it; close the BG–106A.

(3) Place the BG–106A on the PU–626/G trailer, under the roadside shelf.

(4) Secure the AT–903/G to its mounting in the PU–626/G trailer.

(5) Stow Reel, Cable RC–436/GRC on the PU–626/G.

5–3. Packing Assemblage

a. Removing Power.

(1) Operate the LIGHT and INCAND COLD START LIGHT switch to OFF.

(2) Operate the circuit breakers on the POWER DISTRIBUTION PANEL to OFF.

(3) Turn off the generator set or the central power source for the assemblage.

(4) Disconnect the power cable and power cable stub from the power source and from the assemblage POWER 115V AC IN receptacle in the POWER ENTRANCE BOX.

(5) Coil the power cable and power cable stub on Reel RC–435/U (use the cable winding mechanism on the PU–626/G trailer tailgate).

(6) Stow the RC–435/U on the PU–626/G trailer (fig. 1–4), and place the cable winding mechanism in the storage position on the trailer tailgate.

(7) Disconnect the assemblage and PU–626/G ground straps from the POWER ENTRANCE BOX, the generator set, and the ground rods. Store the straps.

(8) Pull the ground rods out of the ground, and mount them in the holder under the curbside of the assemblage (fig. 1–1) and in the storage positions in the PU–626/G.

(9) Raise and secure the PU–626/G trailer tailgate.

b. Checking and Securing Assemblage.

(1) Close and secure the covers on the POWER ENTRANCE BOX and the ANTENNA & VIDEO ENTRANCE boxes.

(2) Close and secure both EXHAUST BLOWER vent covers on the front of the assemblage.

(3) Close and secure the AIR FILTER cover on the assemblage entrance door.

(4) Check the area to make sure that all components and parts have been recovered and stored.

(5) If the assemblage is truck-mounted, remove the stairs from the rear of the assemblage and stow them in the assemblage.

(6) Check the interior of the assemblage to make sure that all components and parts have been properly secured and that all compartment doors are closed and secured.

(7) Close the entrance door and secure it.

(8) If the assemblage is truck-mounted, close and secure the tailgate and check to see that the sling assembly is secure.

5–4. Repackaging for Shipment or Limited Storage

Repackaging of the AN/TRC–109(V) for shipment or limited storage normally will be performed at a packaging facility or by a packaging team. If emergency packaging is required, select materials from those listed in SB 38–100. Package the AN/TRC–109(V) in accordance with the original packaging as far as possible with available materials.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

5–5. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures in paragraph 5–6 will be used to prevent further use of the equipment.

5-6. Methods of Destruction

Use any or all of the following methods to destroy the equipment.

a. Smash. Smash the controls, tubes, coils, relays, switches, capacitors, transformers, and meters.

b. Cut. Cut all cables and cords, and slash the wiring on the components.

***Warning:* Be extremely careful when han ling explosives and incendiary devices. U these items only when the need is urgent.**

c. Burn. Burn cords and technical manual

d. Bend. Bend panels, antenna component and cabinets.

e. Explode. Explode if necessary.

f. Dispose. Bury or scatter the destroyed parts in slit trenches or foxholes, or throw them into streams or lakes.

APPENDIX A

REFERENCES

DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Manauls (Types 7, 8, and 9), Supply Bulletins, Lubrication Orders, and Modification Work Orders.
SB 11–6	Dry Battery Supply Data.
SB 11–30	Transportation, Storage, Testing, Shelf Life, and Quantity Unit Pack Requisitioning of Dry Batteries.
SB 38–100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army.
TB SIG 291	Safety Measures to be Observed when Installing and Using Whip Antennas, Field Type Masts, Towers, Antennas, and Metal Poles That Are Used With Communication, Radar, and Direction Finder Equipment.
TB SIG 354	Maintenance and Repair Procedures for S–141/G-, S–144/G-, S–280/G- and S–318/G-Type Shelters.
TB SIG 364	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 11–2057A	Test Set TS–27B/TSM.
TM 11–2155	Telephone Set TA–312/PT.
TM 11–5410–212–15P	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tool Lists Shelter, Electrical Equipment S–318/G.
TM 11–5805–201–20P	Organizational Maintenance Repair Parts and Special Tool Lists: Telephone Set TA–312/PT.
TM 11–5805–201–35P	Field and Depot Maintenance Repair Parts and Special Tool Lists: Telephone Set TA–312/PT.
TM 11–5805–257–12P	Operator and Organizational Maintenance Repair Parts and Special Tools Lists and Maintenance Allocation Chart: Generators, Ringing, Hand G–42/PT, and G42A/PT.

TM 11–5805–257–35P	Field and Depot Maintenance Repair Parts and Special Tool List: Generators, Ring Hand G–42/PT, and G–42A/PT.
TM 11–5805–367–12	Organizational Maintenance Manual: Multiplexers TD–202/U, TD–203/U, TD–204/U, TD–352/U, and TD–353/U, Restorer, Pu Form TD–206/G, and Converter, Telepho Signal CV–1548/G.
TM 11–5805–367–25P/1	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tool List Multiplexer TD–202/U and TD–203/U.
TM 11–5805–367–25P/2	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tool List Multiplexer TD–204/U.
TM 11–5820–461–12	Organizational Maintenance Manual; Radio Sets AN/GRC–50(V)1, 2, 3, 4, and 5, and AN/GRC–50A(V)1, 2, 3, 4, and 5.
TM 11–5820–461–25P	Organizational, DS, GS, and Depot Maintenance Repair Parts and Special Tool Lists: Radio Sets AN/GRC–50(V)1, 2, 3, 4, and 5 and AN/GRC–50A(V)1, 2, 3, 4, and 5.
TM 11–5820–517–12P	Operator and Organizational Maintenance Repair Parts and Special Tool Lists and Maintenance Allocation Chart: Antenna AT–903/G.
TM 11–5820–517–35P	Field and Depot Maintenance Repair Parts and Special Tool Lists: Antenna AT–903/G.
TM 11–5830–221–12	Operator's and Organizational Maintenance Manual: Intercommunication Stations LS–147A/FI, LS–147B/FI, LS–147C/FI and LS–147D/FI.
TM 11–5830–221–20P	Organizational Maintenance Repair Parts and Special Tool Lists: Intercommunication Stations LS–147A/FI, LS–147B/FI, LA–147C/FI, and LS–147D/FI.
TM 11–5830–221–35P	Field and Depot Maintenance Repair Parts and Special Tool Lists: Intercommunication Stations LS–147A/FI, LS–147B/FI, LS–147C/FI, and LS–147D/FI.
TM 11–5965–206–15P	Operator, Organziational, Field and Depot Maintenance Repair Parts and Special Tool Lists: Headset-Microphone H–91/U, H–91A/U; Handset-Headset H–144/U, H–144A/U, H–144B/U, H–144C/U, and Headset-Microphone H–210/G.

TM 11–5965–224–15P	Operator, Organizational, Field and Depot Maintenance Repair Parts and Special Tool Lists and Maintenance Allocation Chart: Headsets H–60/PT and H–165/U.
TM 11–6625–648–12	Operator and organizational Maintenance Manual; Test Set, Telephone AN/PTM–7. This appendix lists items for Repeater Set,
TM 38–750	Army Equipment Record Procedures.

APPENDIX B

BASIC ISSUE ITEMS

Section I. INTRODUCTION

1. General

This appendix lists items for Repeater Set, dio AN/TRC–109(V) the component items mprising it, and the items which accompany or are required for installation, operation, operator's maintenance.

2. Explanation of Columns

An explanation of the columns in section II given below.

a. Source, Maintenance, and Recoverability des, Column 1.

(1) *Source code, column 1a.* Not used.

(2) *Maintenance code, column 1b.* Not used.

(3) *Recoverability code, column 1c.* The information in this column indicates whether unserviceable items should be returned for recovery or salvage. Recoverability codes and their explanations are as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	Explanation
R	applies to repair parts and assemblies that are economically repairable at DSU and GSU activities and are normally furnished by supply on an exchange basis.

. Federal Stock Number, Column 2. The leral stock number for the item is indicated his column.

c. Description, Column 3. The Federal item name, a five-digit manufacturer's code, and a part number are included in this column.

d. Unit of Issue, Column 4. The unit used as a basis of issue (e.g. ea, pr, ft, yd, etc.) is noted in this column.

e. Quantity Incorporated in Unit Pack, Column 5. Not used.

f. Quantity Incorporated in Unit, Column 6. The total quantity of the item used in the equipment is given in this column.

g. Quantity Authorized, Column 7. The total quantity of an item required to be on hand and necessary for the operation and maintenance of the equipment is given in this column.

h. Illustration, Column 8.

(1) *Figure number, column 8a.* The number of the illustration in which the item is shown is indicated in this column.

(2) *Item or symbol number, column 8b.* Not used.

B–3. Batteries

Dry batteries shown are used with the equipment but are not considered part of the equipment. They will not be preshipped automatically but are to be requisitioned in quantities necessary for the particular organization, in accordance with SB 11–6.

SECTION II. BASIC ISSUE ITEMS LIST

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
		[illegible]	[illegible]							REPEATER SET, RADIO AN/TRC-109(V): (This item is nonexpendable)	[illegible]					
										ITEMS COMPRISING AN OPERABLE EQUIPMENT						
										TECHNICAL MANUAL TM 11-5820-536-15	[illegible]		1	1		
										Requisition through pinpoint number if assigned; [illegible]						
										NOTE: A quantity of one technical manual is packed with each equipment. Where a valid need exists, additional copies may be requisitioned and kept on hand.						
										TECHNICAL BULLETIN TB-SIG-354 ORD THRU AGC	[illegible]		1	1		
										FOR EQUIPMENTS LISTED BELOW ONLY 1 EACH TECHNICAL MANUAL IS AUTHORIZED						
			6115-B00-0009							GENERATOR SET, GASOLINE ENGINE, TRAILER MOUNTED PU-626/G: used with, not part of this equipment	[illegible]			1		
		[illegible]	[illegible]							[illegible]	[illegible]		[illegible]	[illegible]	[illegible]-1	
										OR						
		[illegible]	[illegible]							[illegible]	[illegible]		[illegible]	[illegible]	[illegible]-1	
		[illegible]	[illegible]							[illegible]	[illegible]		[illegible]	[illegible]	5-[illegible]	
										OR						
		[illegible]	[illegible]							[illegible]	[illegible]		[illegible]	[illegible]	[illegible]-1	
		[illegible]	5820-856-992[illegible]							ANTENNA AT-903/G: mtd on power trailer	[illegible]		[illegible]	[illegible]	2-7	
		[illegible]	[illegible]							[illegible], ELECTRONIC EQUIPMENT, MAINTENANCE KIT [illegible]: (NOTE: used to store spare PCM cards. For PCM card listing and FSN see TM 11-5805-367-12)	[illegible]		[illegible]	2	5-1	

[illegible]-MR Form 6010 [illegible] ESC-FM 96-66

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
			BASIC ISSUE ITEMS LIST							AN/TRC-109(V) (continued)						
		R	5820-064-5450							CASE, STANDARDIZED COMPONENTS, ELECTRICAL [illegible]: incl complete complement of spares; mtd on power trailer	ea		2	1		
		R	5820-892-3861							DUMMY LOAD, ELECTRICAL DA-[illegible]	ea		2	2	5-1	
		R	5965-892-3850							HANDSET H-156/U	ea		1	1	5-1	
		R	5820-892-3862							MAST AB-577/GRC: mtd on power trailer (1 digging bar and 1 hammer supplied with 2 AB-577/GRC)	ea		1	1	5-1	
		R	5805-884-2176							MULTIPLEXER TD-202/U	ea		2	2	5-1	
		R	5805-900-8200							MULTIPLEXER TD-904/U	ea		2	2	5-1	
		R	5820 889-0857							POWER SUPPLY PP-[illegible]54/GR	ea		2	2	5-1	
		R	5820-082-4292							RECEIVER, RADIO R-1[illegible]1(F)/GR	ea		1	2	5-1	
		R	6110-064-5476							REGULATOR, VOLTAGE CN-514/GR	ea		1	1	5-1	
		R	5410 933-6834							SHELTER, ELECTRICAL EQUIPMENT S-[illegible]07/TRC-1[illegible](V) MODIFIED S-318/G SHELTER	ea		1	1		
		R	5805-543-0012							TELEPHONE SET TA-[illegible]/PT	ea		1	1	5-1	
		R	5820-892-3863							TRANSMITTER, RADIO T-[illegible](1)/GR	ea		1	1	5-1	
										SHELTER, ELECTRICAL EQUIPMENT S-[illegible]07/TRC-1[illegible]						
			5935-064-5561							ADAPTER, CONNECTOR UG-1373/U: mtd on reel RC-436/GRC	ea		4	2		
			5935-892-8878							ADAPTER, CONNECTOR UG-1374/G: mtd on reel RC-436/GRC	ea		1	1		
			5935-064-5560							ADAPTER, CONNECTOR UG-1375/U: mtd on reel RC-436/GRC	ea		1	2		
			9920-682-6557							ASH TRAY	ea		1	1		

(1) SOURCE CD (A)	MAINT. CD (B)	REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1 2 3 4 5 6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
					AN/TRC 109(V) (continued)						
			[illegible]		[illegible]	ea		1	1	1-1	
			8105-497-9628		BAG, BG-102	ea		1	1	5-1	
			[illegible]		[illegible]	ea		1	1	5-1	
			6135-120-1020		BATTERY DRY BA-30	ea		1	1		
			4140-926 4133		BLOWER EXHAUST: 82877; KS4502, model DRPP-CW	ea		1	1	5-1	
			[illegible]		[illegible]	ea		1	1	5-1	
			4510-595-4085		BRACKET, FIRE EXTINGUISHER: 80063; SC-C-539468	ea		1	1	5-1	
			7920-178-8315		BRUSH, DUSTING, HAND: 80063; SC-C-539469	ea		1	1	5-1	
			[illegible]		[illegible]	ea		1	1		
			5995 889-0848		CABLE ASSEMBLY, POWER ELECTRICAL CX 4558/U: 3 ft, 6 in lg	ea		1	1		
			5995-752-2548		CABLE ASSEMBLY, POWER ELECTRICAL CX-7705/U: 15 ft lg	ea		1	1		
			5995-933-5788		CABLE ASSEMBLY, POWER ELECTRICAL CX-11173B/U: 4 ft lg	ea		4	4		
			5995-933-5783		CABLE ASSEMBLY, RADIOFREQUENCY CG-409H/U: 4 ft lg	ea		1	1		
			5995-933-5782		CABLE ASSEMBLY, RADIOFREQUENCY CG-409H/U: 5 ft lg	ea		2	2		
			5995-889-0852		CABLE ASSEMBLY, RADIOFREQUENCY CG-718B/U: 3 ft lg	ea		4	4		
			5995-889-0853		CABLE ASSEMBLY, RADIOFREQUENCY CG-718/U: 6 ft lg	ea		2	2		
			5995-933-5802		CABLE ASSEMBLY, RADIOFREQUENCY CG-1040B/U: 2-1/2 ft lg	ea		14	14		
			5995-889-0854		CABLE ASSEMBLY, RADIOFREQUENCY CG-1859/U: 40 ft lg; mtd on Reel RC-436/GRC	ea		2	2		

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
										AN/TRC-109(V) (continued)						
			5995-889-0527							CABLE ASSEMBLY, RADIOFREQUENCY CG-1859/U: 80 ft lg; mtd on Reel RC-436/GRC	ea		2	2		
			5995-889-0855							CABLE ASSEMBLY, SPECIAL PURPOSE ELECTRICAL CX-4557/GRC: 3 ft lg	ea		2	2		
			5995-933-6463							CABLE ASSEMBLY, TELEPHONE CX-1200/U: 6 ft lg	ea		1	1		
			5995-933-5966							CABLE ASSEMBLY, TELEPHONE CX-7872/TTC: 5 ft lg	ea		2	2		
			5995-933-5965							CABLE ASSEMBLY, TELEPHONE CX-7875/TTC: 5 ft lg	ea		2	2		
			7105-943-3868							CHAIR, FOLDING: 80063; SC-D-539471	ea		1	1	5-1	
			5975-395-9002							CLAMP, GUY: 80063; SC-C 547187	ea		7	7	5-8	
			7910-753-5256							CLEANER, VACUUM: 29335; 2830	ea		1	1	5-1	
		R	6645-800-7094							CLOCK, AIRCRAFT, MECHANICAL: 98429; 118-12-24-W	ea		1	1	5-1	
			6605-222-1756							COMPASS, MAGNETIC: 88744; 5600-1/2	ea		1	1		
			7210 753-3043							CUSHION, CHAIR: 80063; SC-C-539526	ea		1	1	5-1	
		R	4210-270-4512							EXTINGUISHER, FIRE: 80063; SC-D-539482	ea		1	1	5-1	
			6545-022-1200							FIRST AID KIT: 80063; SC-C-539483	ea		1	1	5-1	
			5120-946-5148							GRIP, CABLE: 95344; EQA-68PH (20 in lg)	ea		5	5		
			5120-946-5114							GRIP, CABLE: 95344; EQA-26SH (15 in lg)	ea		5	5		
			5120-608-0109							HAMMER, SLEDGE: 80063; SC-C-539505	ea		1	1	5-1	
		R	4520-912-3502							HEATER, SPACE, ELECTRICAL: 80063; SC-D-539489	ea		1	1	5-1	
			5965-064-5435							HOLDER HANDSET HT-2161/U	ea		2	2	5-1	

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
										AN/TRC-109 (V) (continued)						
			[illegible]							LADDER, VEHICLE, BOARDING MX-[illegible]/G	ea		1	1	5-1	
			[illegible]							LAMP, GLOW NE-34	ea		1	1	5-3	
			[illegible]							LAMP, GLOW NE-45	ea		6	3	5-3	
			6240-152-2996							LAMP, INCANDESCENT: 24455; P29T12LCW	ea		2	2	5-3	
			[illegible]							LAMP, INCANDESCENT: 24455; P5T8D	ea		2	1	5-3	
			[illegible]							LANTERN, ELECTRIC: 32572; 2106-7	ea		1	1	5-1	
			5410-752-2525							LEAD, ELECTRICAL: for ground: 80063; SM-A-539402	ea		2	2		
			[illegible]							PIN STRAIGHTENER, ELECTRON TUBE: 88065; D-279-SN	ea		1	1	5-1	
			[illegible]							REEL, CABLE RC-436/GRC: mtd on power trailer	ea		2	2		
			[illegible]							REEL, GROUND MX-148/G	ea		2	2	5-1	
			[illegible]							SCREWDRIVER: 80063; SC-[illegible]-539502-4	ea		1	1	5-1	
			7520-162-6178							SHARPENER, PENCIL: 80063; SC-C-539503	ea		1	1	5-1	
			[illegible]							SHACKLE: for GP 113; 80063; SC-C-64939	ea		21	21	2-8	
			4030-298-1382							STAKE GROUND GP-113	ea		7	7	2-8	
			6250-299-2884							STARTER, FLUORESCENT: 71183; FS-2	ea		2	1	5-3	
			5985-933-5481							SUPPORT, ANTENNA AB-959/GRC-50: "T-Bar" mount, 80063; mtd on power trailer; SC-DC-547064	ea		1	1	2-7	
			5210-221 1882							TAPE, STEEL: 80063; SM-D-350561	ea		1	1		
			6625-889-1583							TEST LEAD: black; 80063; SM- -42237	ea		1	1		
			6625-965-0498							TEST LEAD: red; 80063; SM-C-422263	ea		1	1		

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	BASIC ISSUE ITEMS LIST (2) FEDERAL STOCK NUMBER	(3) DESCRIPTION MODEL 1 2 3 4 5 6	(4) UNIT OF ISSUE	(5) QTY INC IN UNIT PACK	(6) QTY INC IN UNIT	(7) QTY AUTH	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(8) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
				AN/TRC-109(V) (continued) NO ACCESSORIES, TOOLS, OR TEST EQUIPMENT ARE TO BE ISSUED WITH THIS EQUIPMENT NO BASIC ISSUE ITEMS ARE MOUNTED IN OR ON THIS EQUIPMENT					

APPENDIX C
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for Repeater Set, Radio AN/TRC-109(V). It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Explanation of Format for Maintenance Allocation Chart

a. Group Number. Group numbers correspond to the reference designation prefix assigned in accordance with ASA Y32.16, Electrical and Electronics Reference Designations. They indicate the relation of listed items to the next higher assembly.

b. Component Assembly Nomenclature. This column lists the item names of component units, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Maintenance Function. This column indicates the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	Explanation
C	Operator/Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance
D	Depot Maintenance

d. Tools and Equipment. The numbers appearing in this column refer to specific tools and equipment which are identified by these numbers in section III.

e. Remarks. Self explanatory.

C-3. Explanation of Format for Tool and Test Equipment Requirements

The columns in the tool and test equipment requirements chart are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number.

e. Tool Number. Not used.

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
1	REPEATER SET, RADIO AN/TRC-109													Preventive maintenance
													3	
														System operation using built-in
													6	
														Test in accordance with
			H											component maintenance allocation chart (MAC)
														Adjust in accordance with
													6	component MAC
													6	
					H								6	
														Repair in accordance with
													6	component MAC
													6	
										H			6	
											H		6	By component
												H	6	Shelter facility only
1a	MULTIPLEXER TD-202/U									#				See TM 11-5805 267-12
1b	MULTIPLEXER TD-204/U									#				See TM 11-5805-367-12
1c	RADIO SET AN/GRC-50(V)									#				See TM 11-5820 461-12
1d	SHELTER, ELECTRICAL EQUIPMENT S-497/TRC-109	C		C										Preventive maintenance
				C									3	
			C										1	Continuity of power, light and signal circuits
			H										2	All tests
										G			2	Power, lighting and signal circuits
										R			4,5	Except skids and door
										H			4,5	
												H	4,5	
1d1	BLOWER, EXHAUST		C										1	
									R				3	
										O			3	Replace motor and impeller

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-109(V) (continued)													
1d2	EXTINGUISHER, FIRE									#				Corps engineers
1d3	HEATER, ELECTRICAL									#				MOCOM responsibility
1d4	INTERCOMMUNICATIONS SET LS-147C/FI									#				See TM 11-5830-221-12
1d5	SHELTER, ELECTRICAL EQUIPMENT S-318/G (MOD)									#				TM 11-5410-212-15P
1e	TELEPHONE SET TA-312/PT									#				TM 11-2155
1f	VOLTAGE SENSOR		O							F			1 3	Operational

#Indicates that maintenance guidance will be found in documents referenced in remarks column

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/TRC-109(V) (continued)		
1	O,F,H,D	MULTIMETER TS-352D/U (WILL BE REPLACED BY AN/USM-223)	6625-581 2036	
2	H,D	OHMMETER [illegible]M-11A/U	6625-246-588	
3	O,F	TOOL KIT, ELECTRONIC EQUIPMENT [illegible]	5180-610-8177	
4	H,D	TOOL KIT, ELECTRONIC EQUIPMENT CHEST TK-144/[illegible]	5180-987-4369	
5	F,H,D	TOOL KIT, GENERAL MECHANICS	[illegible]	
6	O,F,H,D	TOOLS AND TEST EQUIPMENT ASSOCIATED WITH COMPONENTS OF THIS END ITEM		
		NOTE: DEPOT MAY USE ANY OTHER EQUIPMENT REQUIRED TO OVERHAUL OR REBUILD THIS EQUIPMENT		

APPENDIX D

REPAIR PARTS AND SPECIAL TOOLS

Section I. INTRODUCTION

D-1. General

This manual contains a list of repair parts required for the performance of organizational maintenance and a list covering the corresponding requirements for direct support, general support, and depot maintenance for Repeater Set, Radio AN/TRC-109(V).

Note. No special tools, test, and support equipment required for the AN/TRC-109(V).

D-2. Explanation of Sections

This repair parts and special tools list is divided into four principal parts:

a. Prescribed Load Allowance List (PLA)—Section II. The PLA is a consolidated listing of repair parts allocated for initial stockage at organizational maintenance. This is a mandatory minimum stockage allowance.

b. Repair Parts for Organizational Maintenance—Section III. Repair parts authorized organizational maintenance is included in this section.

c. Repair Parts for Direct Support, General Support, and Depot Maintenance—Section IV. This chart lists repair parts authorized for maintenance performance at direct support, general support and depot categories.

d. Federal Stock Number Cross-Reference Index—Section V. This is a cross-reference index of Federal stock numbers to illustrations by figure and item number.

D-3. Explanation of Columns

An explanation of the columns in sections II through IV is given below.

a. Source, Maintenance, and Recoverability Codes, Column 1, Sections III and IV.

(1) *Source code, column 1a.* The selection status and source for the listed item is noted here. Source codes and their explanations are as follows:

Code	Explanation
P	applies to repair parts that are stocked in or supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.

(2) *Maintenance code, column 1b.* The lowest category of maintenance authorized to install the listed item is noted here.

Code	Explanation
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Suport Maintenance

(3) *Recoverability code, column 1c.* The information in this column indicates whether unserviceable items should be returned for recovery or salvage. Recoverability codes and their explanations are as follows:

Note. When no code is indicated in the recoverability column, the part will be considered expendable.

Code	Explanation
R	applies to repair parts and assemblies which are economically repairable at DSU and GSU activities and normally are furnished by supply on an exchange basis.

b. Federal Stock Number, Column 1, Section II; Column 2, Sections III and IV. The Federal stock number for the item is indicated in this column.

c. Description, Column 2, Section II; Column 3, Sections III and IV. The federal item name, a five-digit manufacturer's code, and a part number are included in this column.

Note. The model designator and indenture codes are not used in this repair parts list.

d. Unit of Issue, Column 4, Sections III and IV. The unit used as a basis of issue (e.g. ea, pr, ft, yd, etc.) is noted in this column.

e. Quantity Incorporated in Unit Pack, Column 4, Section II; Column 5, Sections III and IV. Not used.

f. Quantity Incorporated in Unit, Column 6, Sections III and IV. The quantity of repair parts in an assembly is given in this column.

g. Maintenance Allowance, Column 3, Section II; Column 7, Sections III and IV.

(1) The allowance columns are divided in subcolumns. The total quantity of items authorized for the number of equipments supported is indicated in each subcolumn opposite the first appearance of each item. Items authorized for use as required but not for initial stockage are identified with an asterisk (*) in the allowance column.

(2) The quantitative allowances for organizational category of maintenance represents one initial prescribed load for a 15-day period for the number of equipments supported. Units and organizations authorized additional prescribed loads will multiply the number of prescribed loads authorized by the quantity of repair parts reflected in the appropriate density column to obtain the total quantity of repair parts authorized.

(3) Subsequent changes to organizational allowances will be limited as follows: change in the range of items is authorized. If additional items are considered necessary, recommendation should be forwarded to Commanding General, U. S. Army Electronics Command, ATTN: AMSEL–MR–NMP–CC, Fort Monmouth, N. J. 07703, for exception or revision to the allowance list. Revisions to the range of items authorized will be made by the USA ECOM National Maintenance Point based upon engineering experience, demand data, or TAERS information.

(4) The quantitative allowances for DS GS categories of maintenance will represent initial stockage for a 30 day period for the number of equipments supported.

h. One-Year Allowances Per 100 Equipments/Contingency Planning Purposes, Column 8, Section IV. Opposite the first appearance of each item, the total quantity required for distribution and contingency planning purposes is indicated. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for one year.

i. Illustration, Column 8, Section III; Column 10, Section IV.

(1) *Figure number, column 8a and 10a.* The number of the illustration in which the item is shown is indicated in this column.

(2) *Item or symbol number, column 8b and 10b.* The callout number used to reference the item in the illustration is indicated in this column.

j. Depot Maintenance Allowance Per 100 Equipments, Column 9, Section IV. This column indicates the total quantity of each item authorized depot maintenance for 100 equipments.

D–4. Location of Repair Parts

a. When the Federal stock number is unknown follow the procedures given in (1) through (4) below.

(1) Use the table of contents to locate the appropriate appendix of the repair parts list.

(2) If the item or symbol number is available, locate the item by scrutiny of columns 8*b* and/or 10*b* of the repair parts list.

(3) If the item, symbol, and figure number is not known, check the description column (column 3) in the repair

parts list to locate the part. The parts in this column are arranged in alphabetical order.

(4) Locate the applicable illustration in this manual and note the figure number and item number. Use the repair parts listing and locate the figure number and item number as noted on the illustration.

b. When the Federal stock number is known, se the repair part listing to find the repair art and the figure and item numbers as oted in the index of Federal stock numbers.

-5. Federal Supply Codes

This paragraph lists the Federal supply code nd the associated manufacturer's name.

ode number	Manufacturer's name
2777	Hopkins Engineering Co
6229	Electrovert Inc

Code number	Manufacturer's name
06473	Amphenol Corp, Amphenol Space and Missile Systems Div
12143	The Bendix Corp Scintilla Plant of Sidney, N. Y.
21873	Slater Electric Co
24455	General Electric Co
29335	Hoover Co
32572	Justrite Mfg Co
71183	Bryant Electric Co
71468	ITT Cannon Electric Inc
72619	Dialight Corp
74545	Harvey Hubbell Inc
75582	Leviton Mfg Co
80063	Army Electronics Command Procurement and Production Directorate
81349	Military Specifications
82877	Rotron Mfg Co Inc
88065	Burwen Frank Co
88744	Keuffel and Esser Co
90211	Square D Co
91737	Gremar Mfg Co Inc
91929	Honeywell Inc Micro Switch Div
93993	Midwest Electric Products Inc
95344	Economy Cable Grip Co
98429	Wakmann Watch Co Inc

SECTION II. PRESCRIBED LOAD ALLOWANCE

PRESCRIBED LOAD ALLOWANCE

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION	(3) 15-DAY ORG. MAINT. ALLOWANCE (A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100	(4) QTY INC IN UN PK
[illegible]	CLIP, RETAINING: holds cable in cable clamps; 06229; N7	*	*			
[illegible]	CAPACITOR, FIXED, PAPER DIELECTRIC: 02777; 591E	*	*	*		
[illegible]	CIRCUIT BREAKER: 90211: Q0-120	*	*	*	*	
[illegible]	CIRCUIT BREAKER: 90211; Q0-115	*	*			
[illegible]	CIRCUIT BREAKER: 90211: Q0-130	*	*	*		
[illegible]	SWITCH TOGGLE: 24455; 5521-1	*	*			
[illegible]	SWITCH SENSITIVE: 91929; BZ2RQ181T	*	*	*		
[illegible]	CONNECTOR, PLUG, ELECTRICAL U-237A/G: for 15 ft and 100 ft pwr cable assys	*	*	2	2	
[illegible]	CONNECTOR, RECEPTACLE, ELECTRICAL U-238A/G	*	*	*		
5935-283-2950	CONNECTOR, PLUG, ELECTRICAL U-77/U	*	*	*		
5935-578-3848	CONNECTOR, RECEPTACLE, ELECTRICAL: 74545; 5262	*	*			
5935-702-0127	CONNECTOR, RADIOFREQUENCY UG-567A/U	*	*			
5935-796-1731	RECEPTACLE AND SWITCH ASSEMBLY: 75582; 5225	*	*			
5935-823-0487	CONNECTOR, RADIOFREQUENCY UG-88D/U	*	*			
5935-892-9075	CONNECTOR, PLUG, ELECTRICAL: 12143; Q7A14A-7S	*	*			
[illegible]	CONNECTOR, RECEPTACLE, ELECTRICAL: 71468; KPT06G12-3S	*	*			
[illegible]	CONNECTOR, RECEPTACLE, ELECTRICAL: mtd in sig ent box; 91737; 13738	*	*	*		
5935-930-1211	CONNECTOR, RECEPTACLE, ELECTRICAL: mtd in sig ent box; 91737; 13739	*	*	*		
5935-946-1272	CONNECTOR, RECEPTACLE, ELECTRICAL: female; mtd in sig ent box; 80063: ES-C-194240-II	*	*	*		
[illegible]	CONNECTOR, RECEPTACLE, ELECTRICAL: male; mtd in sig ent box; 80063; ES-C-194239-II	*	*	*		
5935-973-0637	CONNECTOR, RADIOFREQUENCY UG-1375/G	*	*	*		
5940-223-5293	POST BINDING U-106/U: mtd in sig ent box	*	*	*		
5940-254-2244	CAP, ELECTRICAL: for binding parts; 80063; SC-C-76202-1	*	*	*		
5975-224-5260	ROD GROUND MX-148/G	*	*			
5975-636-7145	CONNECTOR, PLUG, ELECTRICAL UP-121/M	*	*			
6105-930-3722	MOTOR, ELECTRICAL: for blowers; 82877; 328-AS	*	*	*		
6240-152-2996	LAMP, FLUORESCENT: 24455; F20T12/CW	*	*			

PRESCRIBED LOAD ALLOWANCE

(1) FEDERAL STOCK NUMBER	(2) DESCRIPTION	(3) 15-DAY ORG. MAINT. ALLOWANCE (A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100	(4) QTY INC IN UN PK
	AN/TRC-109(V) (continued)					
6240-179-1814	LAMP GLOW NE-45	*	*	2	2	
6240-274-4027	LAMP, INCANDESCENT: 24455; 25T8DC	*	*	2	2	
6250-299-2884	STARTER, FLUORESCENT: 71183; FS-2	*	*	2	2	
6250-635-9753	LAMP, GLOW NE-34	*	*	*	2	
6250-761-6330	LAMPHOLDER: 72619; 4-06-18	*	*	*	2	

SECTION III. REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 15 DAY ORG. MAINT. ALW. (A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(B) ITEM OR SYMBOL NUMBER
		R	5820-868-[illegible]							REPEATER SET, RADIO AN/TRC-109(V): An air or vehicular transportable assemblage used to provide radio and cable communication facilities. May be used as a cable repeater, radio terminal, radio repeater, or special application as needed. (This item is nonexpendable)	ea								
										SHELTER, ELECTRICAL EQUIPMENT S-297/TRC-109									
F	[illegible]		6625-892 5315							AMMETER: [illegible]1349; MR36W[illegible]	ea		1	*	*	*	*	5-3	A
F	[illegible]		5920-930-2307							ARRESTOR, LIGHTNING: mtd in Sig Ent Box; 80063; [illegible]-B-54[illegible]23	ea		4	*	*	*	*	1-13	
F	[illegible]		[illegible]-484[illegible]							BALLAST, LAMP: [illegible]; [illegible]	ea		2	*	*	*	*	5-3	BALL-1, -2
F	[illegible]		5995-889-1500							CABLE ASSEMBLY, ELECTRICAL CX-7453/U: 100 ft lg	ea		1	*	*	*	*		
F	[illegible]		5[illegible]-[illegible]54-[illegible]44							CAP, ELECTRICAL: for binding posts; 80063; [illegible]-1	ea		6	*	*	*	2		
F	[illegible]		5910-553-6093							CAPACITOR, FIXED, PAPER DIELECTRIC: [illegible]7; 591B	ea		2	*	*	*	2	5-3	FL1, 2
F	[illegible]		5925-682-1061							CIRCUIT BREAKER: 90211; QO-115	ea		3	*	*	2	2	5-3	CB1, 2, 4
F	[illegible]		5925-523-5764							CIRCUIT BREAKER: 90211; QO-120	ea		1	*	*	*	*	5-3	CB3
F	[illegible]		5925-682-4096							CIRCUIT BREAKER: 90211; QO-130	ea		2	*	*	*	2	5-3	CB5, 6
F	[illegible]		[illegible]-1[illegible]71							CIRCUIT BREAKER: 90211; QO-250	ea		1	*	*	*	*	5-3	CB7
F	[illegible]		5340-884-9983							CLIP, RETAINING: holds cable in cable clamps; 06229; N7	ea		2	*	*	2	2		
F	[illegible]	R	6645-800-7094							CLOCK, AIRCRAFT MECHANICAL: [illegible]; 11[illegible]-[illegible]-24-W	ea		1	*	*	*	*	5-1	
F	[illegible]		5935-283-2950							CONNECTOR, PLUG, ELECTRICAL U-77/U	ea		2	*	*	*	2		
F	[illegible]		5935 064 5731							CONNECTOR, PLUG, ELECTRICAL U-237A/G: for 15 ft and 100 ft pwr cable assys	ea		3	*	*	2	2		

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	REPAIR PARTS FOR ORGANIZATIONAL MAINTENANCE (2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 15 DAY ORG. MAINT. ALW. (A) 1–5	(B) 6–20	(C) 21–50	(D) 51–100	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(B) ITEM OR SYMBOL NUMBER
										AN/TRC-109(V) (continued)									
P	O		5975-636-7145							CONNECTOR, PLUG, ELECTRICAL UP-121/M	ea		8	*	*	2	2		
P	O		5935-892-9083							CONNECTOR, PLUG, ELECTRICAL: 06473: Q7A24A-22P	ea		1	*	*	*	*		
P	O		5935-892-9075							CONNECTOR, PLUG, ELECTRICAL: 12143; Q7A14A-7S	ea		4	*	*	2	2		
P	O		5935-823-0487							CONNECTOR, RADIOFREQUENCY UG-88D/U	ea		8	*	*	2	2		
P	O		5935-702-0127							CONNECTOR, RADIOFREQUENCY UG-567A/U	ea		4	*	*	2	2		
P	O		5935-973-0637							CONNECTOR, RADIOFREQUENCY UG-1375/U	ea		2	*	*	*	2		
P	O		5935-930-1210							CONNECTOR, RECEPTACLE, ELECTRICAL: sig ent box; 91737; 13738	ea		2	*	*	*	2	1-13	
P	O		5935-930-1211							CONNECTOR, RECEPTACLE, ELECTRICAL: mtd in sig ent box; 91737; 13739	ea		2	*	*	*	2	1-13	
P	O		5935-946-1272							CONNECTOR, RECEPTACLE, ELECTRICAL: female; mtd in sig ent box; 80063; ES-C-194240-II	ea		2	*	*	*	2	1-13	
P	O		5935-947-2925							CONNECTOR, RECEPTACLE, ELECTRICAL: male; mtd in sig ent box; 80063; ES-C-194239-II	ea		2	*	*	*	2	1-13	
P	O		5935-259-3313							CONNECTOR, RECEPTACLE, ELECTRICAL: 74545: 7210B	ea		1	*	*	*	*	5-3	J4
P	O		5935-930-1207							CONNECTOR, RECEPTACLE, ELECTRICAL: 71468; KPT06G12-3S	ea		4	*	*	2	2		
P	O		5935-578-3848							CONNECTOR, RECEPTACLE, ELECTRICAL: 74545: 5262	ea		7	*	*	2	2	5-3	J3, 5, 6, 7, 8, 9, 10
P	O		5935-064-5732							CONNECTOR, RECEPTACLE, ELECTRICAL U-238A/G	ea		2	*	*	*	2	1-12	J1, 2
P	O		5935-892-9082							CONNECTOR, RECEPTACLE, ELECTRICAL: 06473; Q7A24A-22S	ea		1	*	*	*	*		
P	O		5975-947-3068							COVER, ELECTRICAL: mtd in pwr ent box; 21873; MS-3780-FS	ea		1	*	*	*	*	1-12	

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 15 DAY ORG. MAINT. ALW. (A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(B) ITEM OR SYMBOL NUMBER
										AN/TRC-109(V) (continued)									
										[illegible]	ea		1	*	*	*	*	5-1	
			5935-659-1562							[illegible]	ea		2	*	*	*	*		
			6250-995-9074							[illegible]	ea		2	*	*	*	*	5-3	XDS10, 11
			[illegible]							LAMPHOLDER: 72619; 4-06-18	ea		6	*	*	*	2	5-3	XDS1 thru 6
			6250-299-6562							LAMPHOLDER: 74545; 4109	ea		1	*	*	*	*	5-3	XDS7
			[illegible]							LAMPHOLDER, FLUORESCENT: incl started socket; [illegible]	ea		2	*	*	*	*	5-3	XDS8, 9
			6250-299 6093							LAMPHOLDER, FLUORESCENT: 24455; 78-491	ea		2	*	*	*	*	5-3	XDS8, 9
			6240-152-2996							LAMP, [illegible]	ea		2	*	*	2	2	5-3	DS8, 9
			6250-635-9753							LAMP, GLOW NE-34	ea		1	*	*	*	2	5-3	DS7
			6240-179-1814							LAMP GLOW NE-45	ea		6	*	*	2	2	5-3	DS1 thru 6
			6240-274-4027							LAMP, INCANDESCENT: 24455; 25T8DC	ea		2	*	*	2	2	5 3	DS10, 11
		F	[illegible]							[illegible]	ea		2	*	*	*	*		
			5940-223-5293							POST BINDING U-106/U: mtd in sig ent box	ea		2	*	*	*	2		
			5935-796-1731							RECEPTACLE AND SWITCH ASSEMBLY: 75582: 5225	ea		1	*	*	2	2	5-4	S5J11, S6J12
			8130-656 1090							REEL, CABLE RC-435/U: mtd in pwr trailer	ea		1	*	*	*	*		
			5410-793-2021							REPAIR KIT, ELECTRONIC [illegible], MK-680/G: (NOTE: to be requisitioned for immediate use only, order direct from depot stock)	ea								
			[illegible]							[illegible]	ea		2	*	*		2		
			6210-930-1217							[illegible]	ea		1	*	*	*	*		

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 15 DAY ORG. MAINT. ALW. (A) 1-5	(B) 6-20	(C) 21-50	(D) 51-100	(8) ILLUSTRATIONS (A) FIGURE NUMBER	(B) ITEM OR SYMBOL NUMBER
										AN/TRC-109(V) (continued)									
P	O		6210-921-6682							SHIELD, LIGHT: for fluorescent lamps; 80063: SC-B-539466	ea		2	*	*	*	*		
P	O		6250-299-2884							STARTER, FLUORESCENT: 71183; FS-2	ea		2	*	*	2	2	5-1	
P	O		5930-944-1086							SWITCH SENSITIVE: 91929: MZ2RQ181T	ea		1	*	*	*	2	5-3	S1
P	O		5930-636-4014							SWITCH, TOGGLE: 24455; 5521-1	ea		3	*	*	2	2	5-3	S2, 3, 4
P	O		5950-705-9105							TRANSFORMER: 93993; 3CT-35B	ea		1	*	*	*	*	5-3	T1
P	O		6625-682-4723							VOLTMETER: 81349; MR36W150ACVVR	ea		1	*	*	*	*	5-3	V

SECTION IV. REPAIR PARTS, SPECIAL TOOLS, TEST AND SUPPORT, AND DEPOT MAINTENANCE

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	(3) MODEL 1	2	3	4	5	6	(3) CD IND	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UNPK	(6) QTY INC IN UNIT	(7) 30 DAY MAINT. ALW. DS (A) 1-20	DS (B) 21-50	DS (C) 51-100	GS (A) 1-20	GS (B) 21-50	GS (C) 51-100	(8) 1 YR. ALW. PER 100 EQUIP. CNTGCY PL.	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (A) FIGURE NUMBER	(10) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
											REPEATER SET, RADIO AN/TRC-109(V): An air or vehicular transportable assemblage used to provide radio and cable communication facilities. May be used as a cable repeater, radio terminal, radio repeater, or special application as needed. (This item is nonexpendable) SHELTER, ELECTRICAL EQUIPMENT S-297/TRC-109													
P			6625-892-5315								AMMETER: 81349; MR36W050SPECR	ea		1	*	*	*	*	*	2	5	5	5-3	A
P			5925-930-1407								ARRESTOR, LIGHTNING: mtd in sig ent box; 80063; SC-B-547223	ea		4	*	*	2	*	*	2	10	12	1-13	
P			6250-900-4845								BALLAST, LAMP: 24455; 89G457D	ea		2	*	*	2	*	*	2	10	4	5-3	BALL-1, -2
P			6145-752-2473								CABLE, POWER ELECTRICAL WT-26/U: for 15 ft and 100 ft power cable assys: 80063; SC-A-46608	ft		115	*	*	*	*	*	*	406	1150		
P		0	5995-889-1500								CABLE ASSEMBLY, ELECTRICAL CX-7453/U: 100 ft lg	ea		1	*	*	2	*	*	2	8	6		
P		0	5940-254-2244								CAP, ELECTRICAL: for binding posts 80063; SC-C-76202-1	ea		6	*	2	2	*	*	2	13	30		
P		0	5910-553-6093								CAPACITOR, FIXED, PAPER DIELECTRIC: 03777; 591B	ea		2	*	2	2	*	*	2	13	12	5-3	FL1, 2
P		0	5925-682-1061								CIRCUIT BREAKER: 90211; QO-115	ea		3	*	2	2	*	2	2	19	18	5-3	CB1, 2, 4
P		0	5925-523-5764								CIRCUIT BREAKER: 90211; QO-120	ea		1	*	*	2	*	*	2	8	6	5-3	CB3
P		0	5925-682-4096								CIRCUIT BREAKER: 90211: QO-130	ea		2	*	2	2	*	*	2	13	12	5-3	CB5, 6
P		0	5925-682-1071								CIRCUIT BREAKER: 90211; QO-250	ea		1	*	*	2	*	*	2	8	6	5-3	CB7
P		0	5340-884-9983								CLIP, RETAINING: holds cable in cable clamps; 06229; N7	ea		2	*	2	2	*	2	2	19	20		

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	IND CD	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 30 DAY MAINT. ALW. DS (A) 1–20	DS (B) 21–50	DS (C) 51–100	GS (A) 1–20	GS (B) 21–50	GS (C) 51–100	(8) 1 YR. ALW. PER 100 EQUIP. CNTGCY PL.	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (A) FIGURE NUMBER	(10) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
											AN/TRC-109(V) (continued)													
P	0	R	6645-800-7094								CLOCK, AIRCRAFT MECHANICAL: 98429; 118-12-24-W	ea		1	*	*	*	*	*	2	4	5	5-1	
P	0		5935-283-2950								CONNECTOR, PLUG, ELECTRICAL U-77/U	ea		2	*	2	2	*	*	2	13	10		
P	0		5935-064-5731								CONNECTOR, PLUG, ELECTRICAL U-237A/U: for 15 ft and 100 ft pwr cable assys	ea		3	*	2	2	*	2	2	18	15		
P	0		5975-636-7145								CONNECTOR, PLUG, ELECTRICAL UP-121/M	ea		8	2	2	3	2	2	2	40	40		
P	0		5935-892-9083								CONNECTOR, PLUG, ELECTRICAL: 06473; 27A24A-22I	ea		1	*	*	2	*	*	2	8	5		
P	0		5935-892-9075								CONNECTOR, PLUG, ELECTRICAL: 12143; 27A14A-7S	ea		4	*	2	2	2	2	2	19	20		
P	0		5935-823-0487								CONNECTOR, RADIOFREQUENCY UG-88D/U	ea		8	2	2	3	2	2	2	40	40		
P	0		5935-702-0127								CONNECTOR, RADIOFREQUENCY UG-567A/U	ea		4	*	2	2	2	2	2	19	20		
P	0		5935-973-0637								CONNECTOR, RADIOFREQUENCY UG-1375/U	ea		2	*	2	2	*	*	2	13	10		
P	0		5935-930-1210								CONNECTOR, RECEPTACLE, ELECTRICAL: mtd in sig ent box; 91737; 13738	ea		2	*	2	2	*	*	2	13	10	1-13	
P	0		5935-930-1211								CONNECTOR, RECEPTACLE, ELECTRICAL: mtd in sig ent box; 91737; 13739	ea		2	*	2	2	*	*	2	13	10	1-13	
P	0		5935-946-1272								CONNECTOR, RECEPTACLE, ELECTRICAL: female; mtd in sig ent box; 80063; ES-C-194240-II	ea		2	*	2	2	*	*	2	13	10	1-13	

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5	MODEL 6	IND CD	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 30 DAY MAINT. ALW. DS 1-20	DS 21-50	DS 51-100	GS 1-20	GS 21-50	GS 51-100	(8) 1 YR. ALW. PER 100 EQUIP. CNTGCY PL.	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (A) FIGURE NUMBER	(10) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
											[illegible] (T) ([illegible])													
[illegible]			[illegible]								[illegible], [illegible], [illegible]: male; mtd in sig ent box; 80063: [illegible]	ea		[illegible]	*	[illegible]	[illegible]	*	*	[illegible]	1[illegible]	1[illegible]	1-1[illegible]	
F			5935-259-3313								[illegible], [illegible], [illegible]: [illegible]: [illegible]	ea		1	*	*	[illegible]	*	*	2	[illegible]	5	5-3	J4
F			[illegible]								[illegible], [illegible], [illegible]: [illegible]: [illegible]	ea		4	*	2	[illegible]	2	2	2	19	20		
F			[illegible]								[illegible], [illegible], [illegible]: [illegible]: [illegible]	ea		7	2	2	3	2	2	2	40	40	5-3	J3, 5, 6, 7, 8, 9, 10
F	[illegible]		5935-064-5732								[illegible], [illegible], [illegible]: [illegible]	ea		2	*	2	2	*	*	2	13	10	1-12	J1, 2
F	[illegible]		[illegible]								[illegible], [illegible], [illegible]: [illegible]: [illegible]	ea		1	*	*	2	*	*	2	8	5		
F	[illegible]		5975-947-3068								COVER, ELECTRICAL: mtd in pwr ent box; 21873; MS-2780-FS	ea		1	*	*	*	*	*	2	5	3	1-12	
F	[illegible]		5935-615-1720								JACK, TLEPHONE JJ-089: for TA-[illegible]/PT	ea		1	*	*	*	*	*	2	4	10	5-1	
F			[illegible]								KIT, [illegible]: [illegible]: [illegible]	ea		2	*	*	*	*	*	2	5	10		
P	[illegible]		[illegible]								LAMPHOLDER: 72619; 12-[illegible]	ea		2	*	*	*	*	*	2	5	10	5-3	XDS10, 11
P			6250-761-6330								LAMPHOLDER: 72619; 4-06-18	ea		6	*	2	2	*	*	2	13	30	5-3	XDS1 thru 6
P	[illegible]		6250-299-6562								LAMPHOLDER: 74545; 4109	ea		1	*	*	*	*	*	2	4	5	5-3	XDS7
P	[illegible]		6250-174-4684								LAMPHOLDER, FLUORESCENT: incl started socket; 24455; 78-736	ea		2	*	*	*	*	*	2	5	10	5-3	XDS8, 9
F	C		6250-[illegible]-6[illegible]								LAMPHOLDER, FLUORESCENT: 24455; 78-491	ea		2	*	*	*	*	*	2	5	10	5-3	XDS8, 9

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	(2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	IND CD	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 30 DAY MAINT. ALW. DS (A) 1–20	DS (B) 21–50	DS (C) 51–100	GS (A) 1–20	GS (B) 21–50	GS (C) 51–100	(8) 1 YR. ALW. PER 100 EQUIP. CNTGCY	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (A) FIGURE NUMBER	(10) ILLUSTRATIONS (B) ITEM OR SYMBOL NUMBER
											AN/TRC-109(V) (continued)													
P	O		6240-152-2996								LAMP, FLUORESCENT: 24455; F20T12/CW	ea		2	2	2	2	2	2	2	34	100	5-3	D56, 7
P	O		6250-635-9753								LAMP, GLOW NE-34	ea		1	*	2	2	*	*	2	12	50	5-3	187
P	O		6240-179-1814								LAMP GLOW NE-45	ea		6	2	2	3	2	2	2	46	300	5-3	P81 thru 6
P	O		6240-274-4027								LAMP, INCANDESCENT: 24455; 25T8DC	ea		2	2	2	2	*	2	2	23	100	5-3	C10, 11
P	H		5410-973-2936								MAINTENANCE KIT, ELECTRONIC EQUIPMENT SHELTER, MK-670/G: (NOTE: to be requisitioned for immediate use only, order direct from depot stock)	ea						*	*	*		10		
P	O	R	6105-930-3722								MOTOR, ELECTRICAL: for blowers: 82877; 328-AC	ea		2	*	2	2	*	*	2	13	6		
P	O		5940-223-5293								POST BINDING U-106/U: mtd in sig ent box	ea		6	*	2	2	*	*	2	13	30		
P	O		5935-796-1731								RECEPTACLE AND SWITCH ASSEMBLY: 75582; 5225	ea		2	*	2	2	*	2	2	19	10	5-3	S5J11, S6J12
P	O		8130-656-1090								REEL, CABLE RC-435/U: mtd in pwr trailer	ea		1	*	*	*	*	*	2	5	2		
P	F		5410-771-3354								REPAIR KIT, ELECTRONIC EQUIPMENT SHELTER MK 681/G: (NOTE: to be requisitioned for immediate use only, order direct from depot stock)	ea						*	*	*				
P	O		5975-224-5260								ROD GROUND MX-148/G	ea		2	*	2	2	*	*	2	19	30		
P	O		6210-930-1217								SHIELD LIGHT: for cold start lamps; 86063; SC-[illegible]-547186	ea		1	*	*	*	*	*	2	5	5		

(1) SOURCE CD (A)	(1) MAINT. CD (B)	(1) REC. CODE (C)	REPAIR PARTS FOR DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE (2) FEDERAL STOCK NUMBER	MODEL 1	2	3	4	5	6	CD IND	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QTY INC IN UN PK	(6) QTY INC IN UNIT	(7) 30 DAY MAINT. ALW. DS (A) 1–20	DS (B) 21–50	DS (C) 51–100	GS (A) 1–20	GS (B) 21–50	GS (C) 51–100	(8) 1 YR. ALW. PER 100 EQUIP. CNTGCY PL.	(9) DEPOT MAINT. ALW. PER 100 EQUIP.	(10) ILLUSTRATIONS (A) FIGURE NUMBER	(B) ITEM OR SYMBOL NUMBER
											[illegible]														
			6210-921-6682								SHIELD, LIGHT: for fluorescent [illegible]											1	1		
			[illegible]								[illegible], FLUORESCENT: 71183· [illegible]													1-1	
			5930-944-10[illegible]								[illegible] SITIVE: 91929 [illegible]													1-3	P1
			5930-636-4014								SWITCH, TOGGLE: 24455; 5521-1													1-2	P2, 3, 4
			[illegible]								[illegible]													1-2	T1
			[illegible]								[illegible]													1-2	V

SECTION V. FEDERAL STOCK NUMBER INDEX

INDEX — FEDERAL STOCK NUMBER CROSS REFERENCE TO FIGURE AND ITEM NUMBER OR REFERENCE SYMBOL

STOCK NO.	FIGURE NO.	ITEM NO. REF. SYMBOL	STOCK NO.	FIGURE NO.	ITEM NO. REF. SYMBOL
5910-553-6093	5-3	FL1, 2			
5925-523-5764	5-3	CB3			
5925-682-1061	5-3	CB1, 2, 4			
5925-682-1071	5-3	CB7			
5925-682-4096	5-3	CB5, 6			
5930-636-4014	5-3	CB1, 2, 4			
5930-944-1086	5-3	C1			
5935-064-5732	1-12	J1, 2			
5935-259-3313	5-3	J4			
5935-578-3848	5-3	J3, 5 thru 10			
5935-796-1731	5-3	S5J11 S6J12			
5950-705-9105	5-3	T-1			
6240-152-2996	5-3	DS8, 9			
6240-179-1814	5-3	DS1 thru 6			
6240-274-4027	5-3	DS10, 11			
6250-174-4684	5-3	XDS1, 2			
6250-299-6093	5-3	XDS8, 9			
6250-299-6562	5-3	XDS7			
6250-500-4845	5-3	BALL-1, -2			
6250-635-9753	5-3	DS7			
6250-761-6330	5-3	XDS1 thru 6			
6250-995-9074	5-3	XDS10, 11			
6625-682-4723	5-3	V			
6625-892-5315	5-3	A			

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

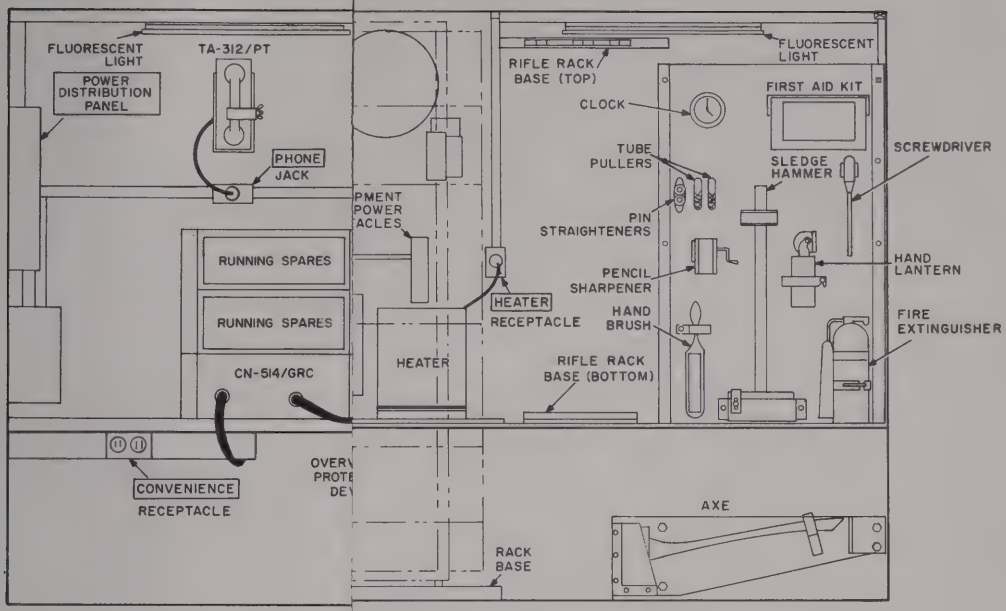
USASA (2)
CNGB (1)
CC–E (7)
Dir of Trans (1)
CofEngrs (1)
TSG (1)
CofSptS (1)
USAARENBD (2)
USACDCEA (1)
USACDCEC (10)
USACDCCBRA (1)
USACDCCEA (1)
USACDCCEA (Ft Huachuca) (1)
USACDCOA (1)
USACDCQMA (1)
USACDCTA (1)
USACDCARMA (1)
USACDCAVNA (1)
USACDCARTYA (1)
USACDCSWA (1)
USACDCADA (1)
USAMC (5)
USCONARC (5)
ARADCOM (5)
ARADCOM Rgn (2)
OS Maj Comd (4)
USASETAF (5)
LOGCOMD (2)
USAMICOM (4)
USASTRATCOM (4)
USAESC (70)
MDW (1)
Armies (2) except
7th USA (10)
8th USA (10)
Corps (2)
USAC (3)
Instl (2) except
Ft Hancock (4)
Ft Gordon (10)
Ft Huachuca (10)
WSMR (5)
Ft Carson (25)
Ft Knox (12)
Svc Colleges (2)
USASESCS (90)
USAADS (2)
USAAMS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USATC Armor (2)
USAECFB (2)
USATC Inf (2)
USASTC (2)
Army Dep (2) except
LBAD (14)
SAAD (30)
TOAD (14)
LEAD (7)
SHAD (3)
NAAD (5)
SVAD (5)
CHAD (3)
ATAD (10)
Gen Dep (2)
Sig Sec, Gen Dep (5)
Sig Dep (12)
AMS (1)
WRAMC (1)
Army Pic Cen (2)
USAERDAA (2)
USAERDAW (13)
USACRREL (2)
Sig FLDMS (2)
Units org under fol TOE:
ea.
7
11–27
11–56
11–57
11–97
11–98
11–117
11–127
11–155
11–157
11–158
11–225
11–337
11–500 (RH–RT)
11–587
11–592
11–597
17
37

NG: State AG (3).

USAR: None.

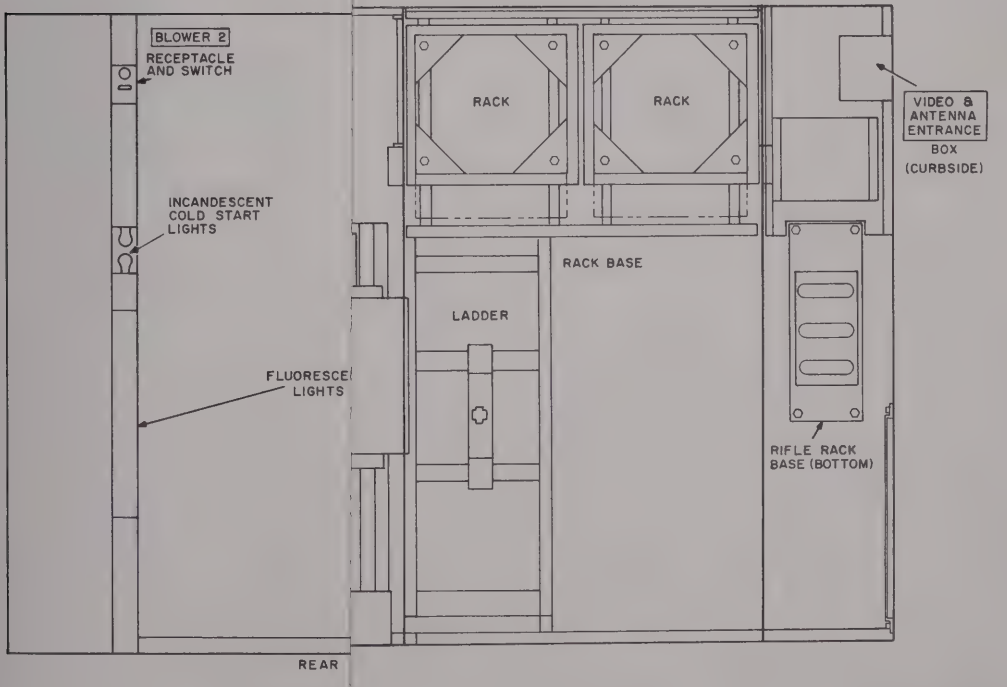
For explanation of abbreviations used, see AR 320–50.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1967—254446/231



A. ROADSIDE

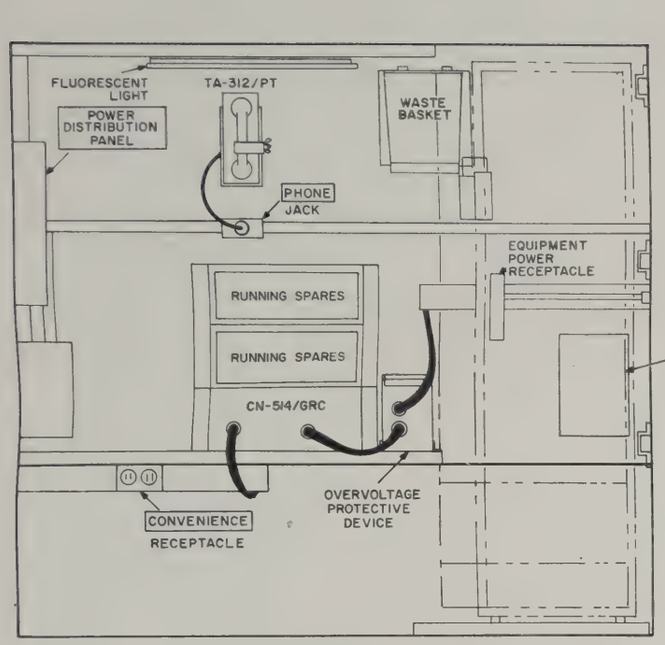
C. CURBSIDE WALL



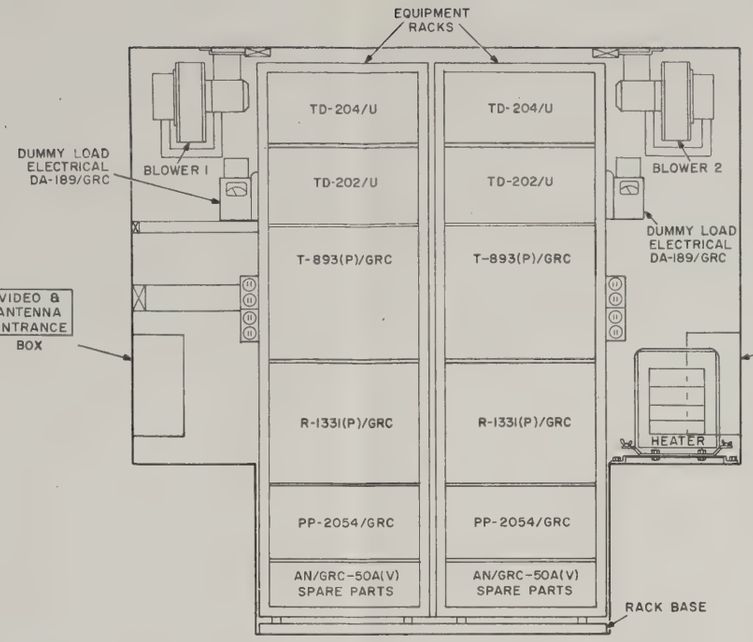
D. CEILI

F. FLOOR PLAN

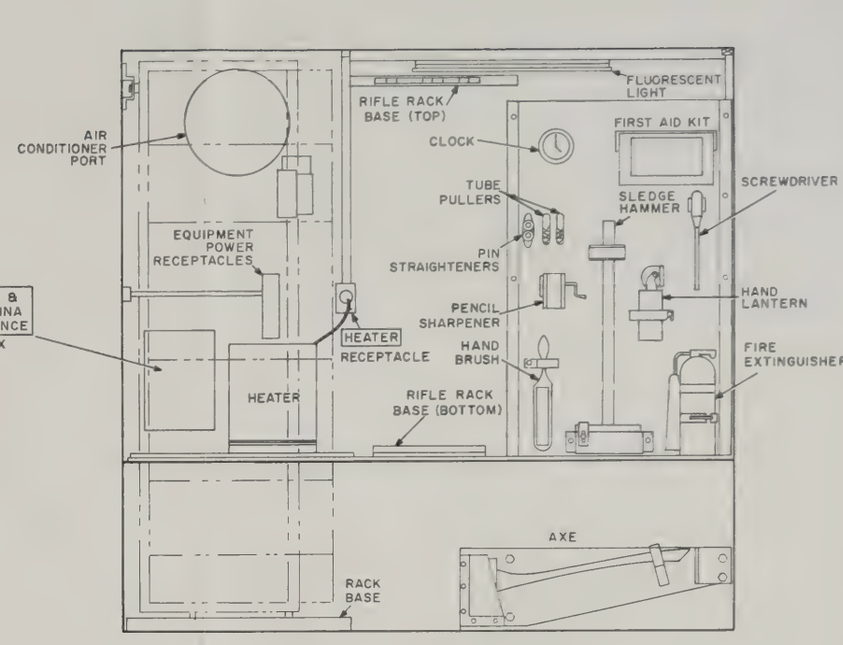
TM5820-536-15-20



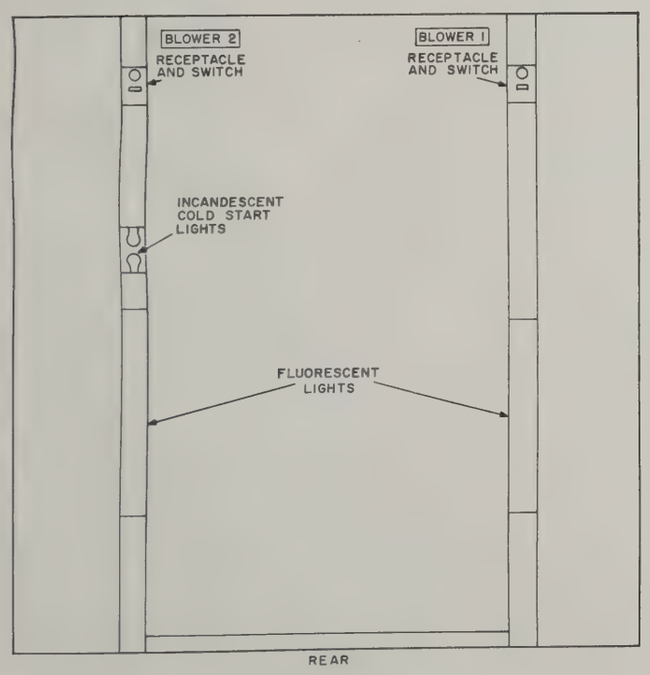
A. ROADSIDE WALL



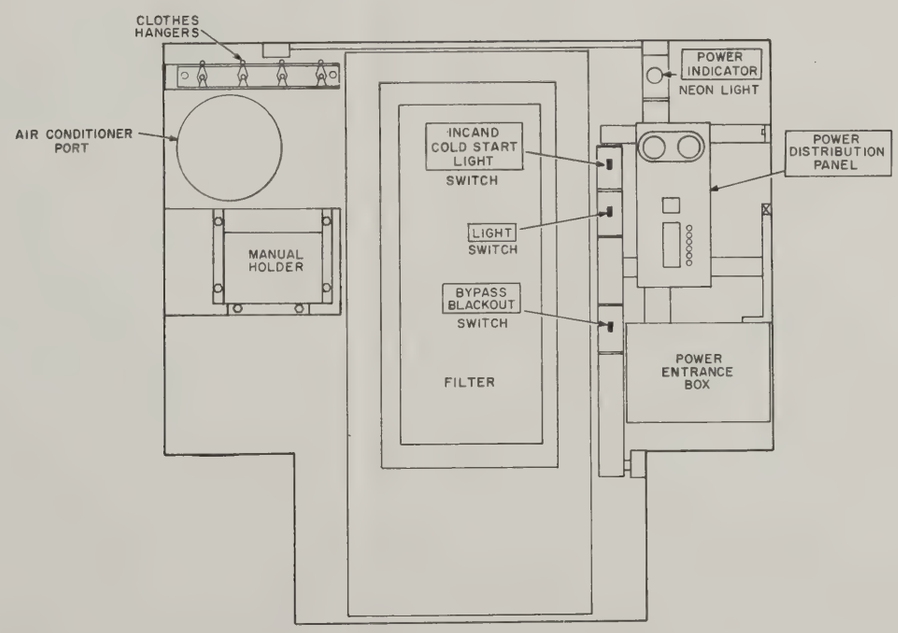
B. FRONT WALL



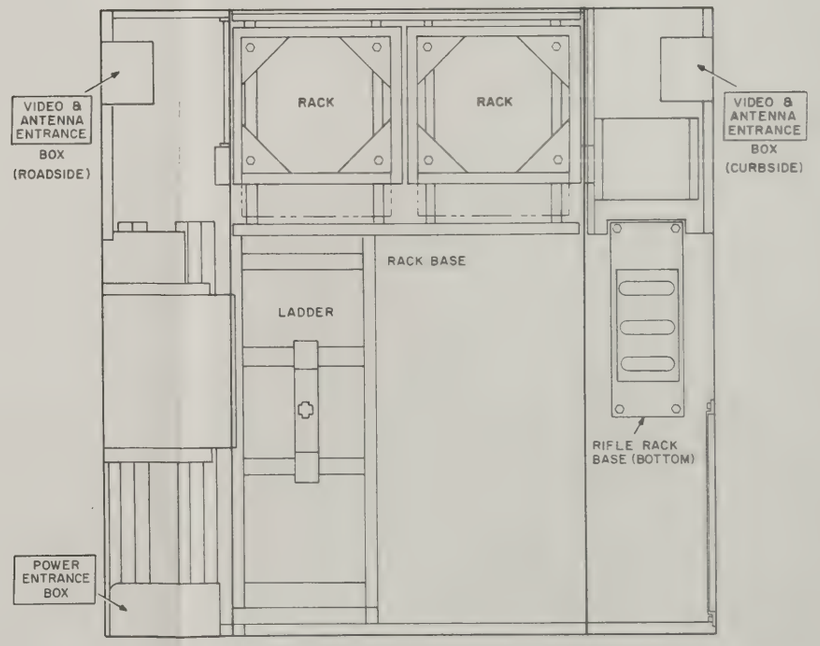
C. CURBSIDE WALL



D. CEILING



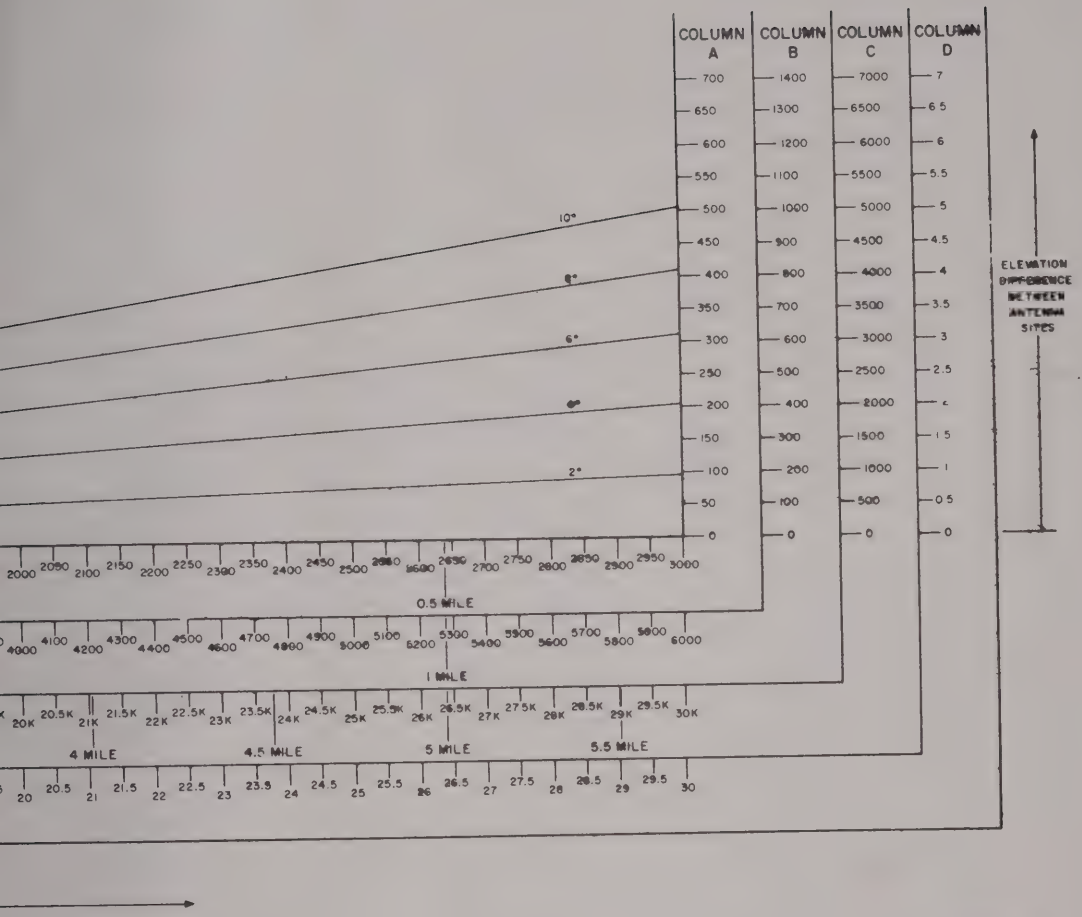
E. ENTRANCE WALL



F. FLOOR PLAN

TM5820-536-15-20

Figure 5–1. AN/TRC–109(V), floor plan and elevation diagram.



TM5820-461-20-2

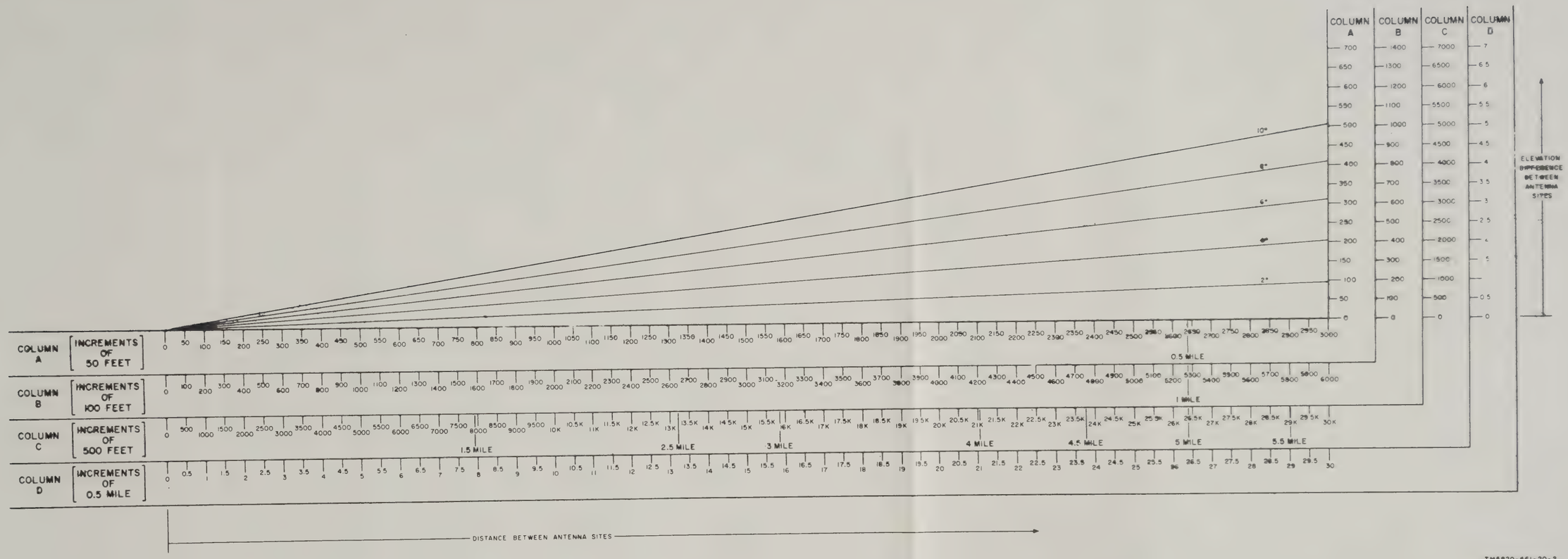
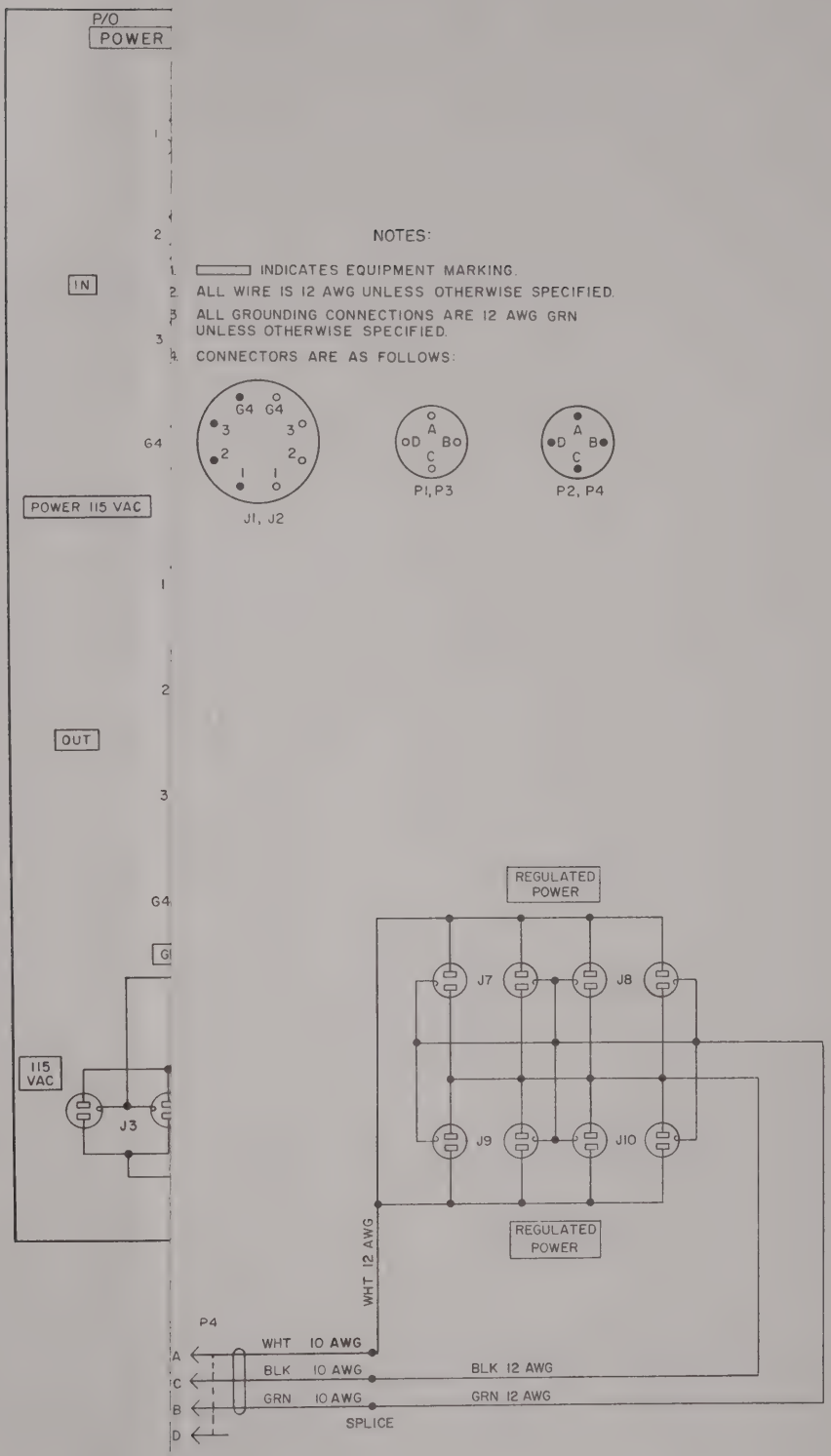
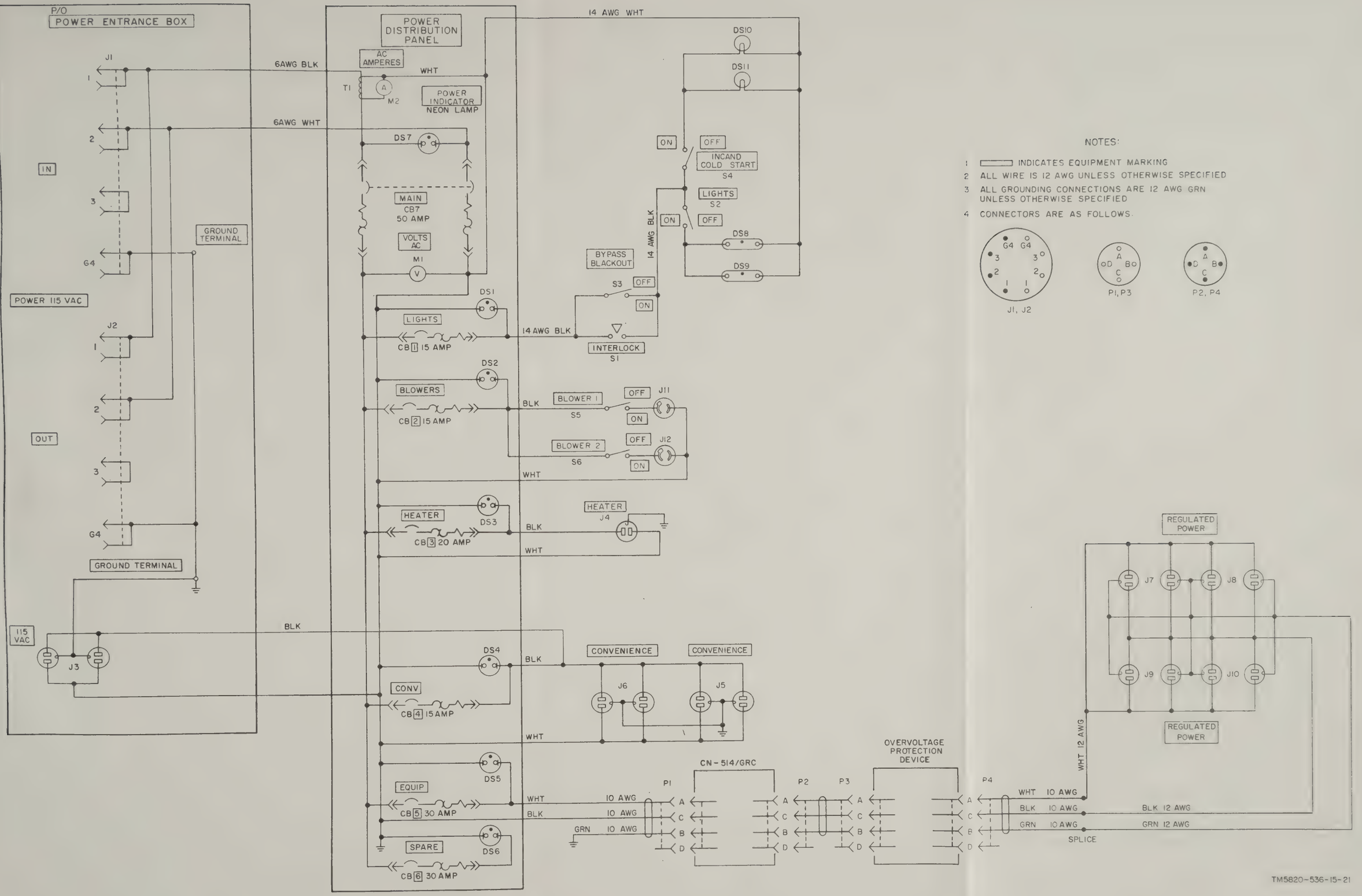


Figure 5–2. Elevation angles for AT–903/G.



TM5820-536-15-21



NOTES:

1. ▭ INDICATES EQUIPMENT MARKING
2. ALL WIRE IS 12 AWG UNLESS OTHERWISE SPECIFIED
3. ALL GROUNDING CONNECTIONS ARE 12 AWG GRN UNLESS OTHERWISE SPECIFIED
4. CONNECTORS ARE AS FOLLOWS:

Figure 5–3. AN/TRC–109(V), ac power distribution, schematic-wiring diagram.

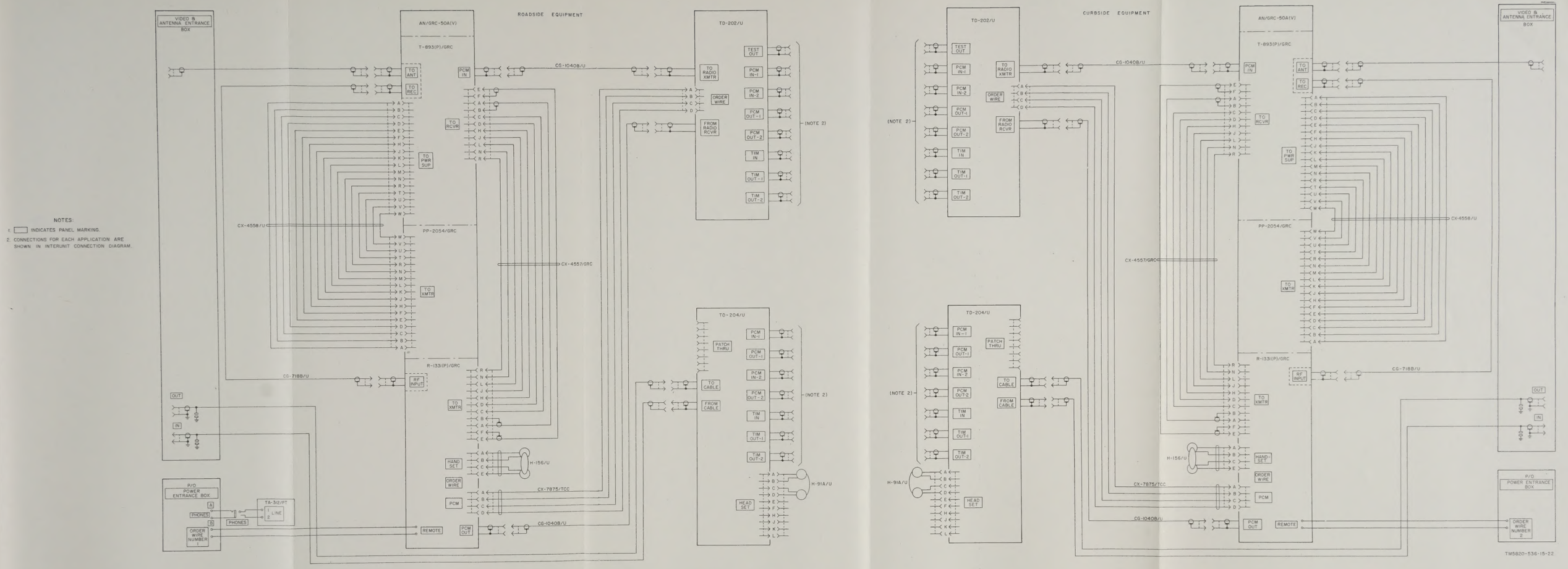


Figure 5–4. AN/TRC–109(V), signal schematic-wiring diagram.